August 1978

Smithsonian

Smithsonian's tiger-saving operation (p. 28)

A Bengal (above and back cover)
looks up, surfeited, after a kill

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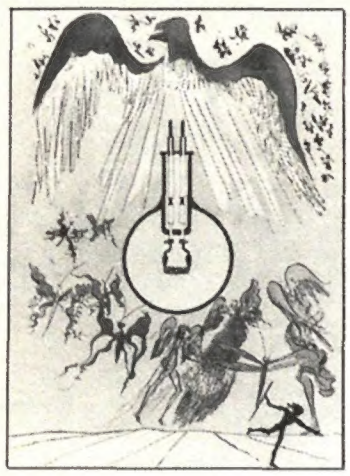

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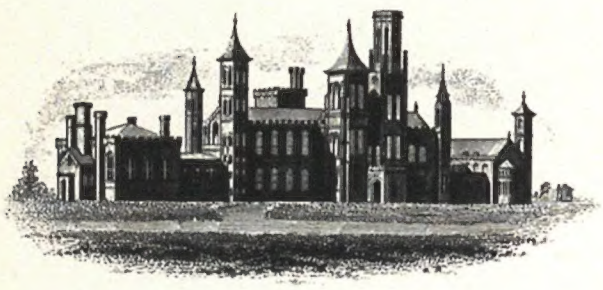
Secretary Ripley's comments

The view from the castle



Since 1900 Père David's deer has survived only in zoos—but so successfully that it raises a question: What do we do next?

Near Front Royal, Virginia—not far west of Washington—it is possible, if one is standing on a sharp hillside of the Blue Ridge, to look down on a scene straight out of China's past. Below lies a marshy area with scattered alders and elms. Off to the right are five males of one of the rarest and strangest deer in the world, Père David's, named for the French missionary and naturalist Father Armand David, who first glimpsed them over the walls of the Imperial Hunting Park south of Peking sometime around 1865.

The huge, ungainly-looking stags (for they stand four feet high at the shoulders and may weigh as much as 475 pounds) seem to inhabit a scene from prehistoric times. Père David's is not a normal deer. In China it is called *Mi-lu* or, more picturesquely, *Ssu-pu-hsiang*—"Four unlikes," meaning that it has characteristics of the donkey, deer, ox and camel. Its body, especially with the dark brown stripe down the back, is like that of a wild ass or a donkey; its antlers are deerlike but strange; its hooves and long, hairy tail are like those of an ox; and the woolly coat and elongated snout resemble a camel's. Like the Giant Panda, which Père David also discovered, this undeerlike deer must have seemed one of the most inscrutable of Oriental mysteries to Western naturalists for the next generation.

Bones of these unique creatures were used as tools or knives during Shang times about 1800 B.C., and the shoulder blades, covered with pictograph writing, are included among the so-called "oracle bones" found in tombs of the period. All indications seem to be that, as the reed beds and marshes of central China were drained and cleared for cultivation, these swampy-ground deer were gradually forced out of their habitat and hunted down.

Extinct in the wild since times unknown, they apparently survived only in the Imperial Hunting Park, from which a handful were sent to European zoos in the latter half of the 19th century. During a flood in 1895, the walls of the park were breached and most of the deer escaped into the surrounding countryside, where they were killed and eaten by the peasants. The few left in the park were destroyed five years later during the Boxer Rebellion. The only specimen remaining in China died in a Peking zoo in 1920.

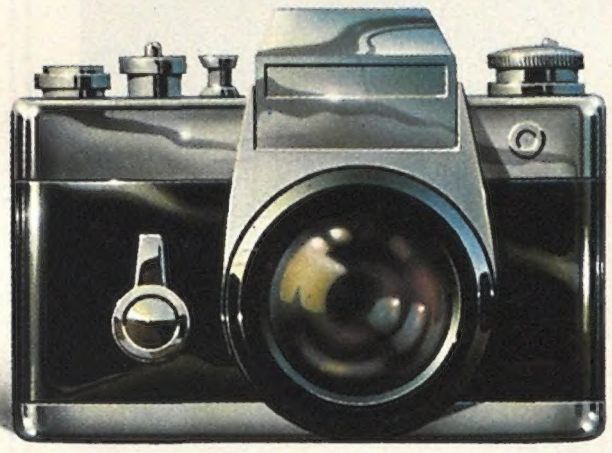
Of the animals that reached Europe, fewer than 20 were eventually gathered up from zoos by the Duke of Bedford, who maintained a splendid private park at Woburn Abbey. By the 1940s, when I first visited Woburn, the herd miraculously had increased to about 250 head. In July the males had full antlers with unusual, backward-reaching, three-foot-long tines.

At a recent Père David's deer workshop at the National Zoological Park's Conservation and Research Center in Front Royal, we learned that the care of these singular creatures has resulted in a World Register showing 792 animals alive in 1977 in Europe, Asia and North America. And so the species lives.

What shall we do with them? In this distraught world is there any place in the wild for Père David's deer? In China? Most people think not. Perhaps if we could read the messages on the oracle bones, one of them could tell us. But the deer can't wait another four thousand years.

S. Dillon Ripley

Add 400 to 35 and subtract the flash.



If you want to get more out of your 35mm camera, put Kodacolor 400 film into it. Kodacolor 400 film is so fast and versatile, you can get the kind of color prints you couldn't get before, without a flash. You can freeze the action in midair, midstride or midgallop, shoot in museums, theaters and arenas, and capture the sun from when it's barely a promise to when it's almost a memory. All in clear, sharp beautiful color prints with a grain that's surprisingly fine.

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"WE SPENT SO MUCH TIME TEST DRIVING THE AUDI 5000 IN AMERICA, I ACQUIRED A TASTE FOR CHEESEBURGERS."

DR. HANS SASSOR, CHIEF OF NORTH AMERICAN TEST PROGRAM

How do you like them? Rare, medium or well?

Sassor: Medium to rare. But that's not the same thing everywhere in the U.S. In San Francisco, medium-rare came out rare. In Texas, they really cook the meat. But on the East Coast, I got medium-rare more often. Your burgers are as different as your driving conditions.

How many cars did you test here? And for how long?

Sassor: The test cars were here for nine months in 1977. These 100 prototypes were driven for one and a half million miles all over America and Canada. It was all very tiring, but exhilarating. North America is such a magnificent continent.

What did you find different about driving in America?

Sassor: The weather conditions. North America has greater temperature variations than we have. It gets terribly hot in the southern states. Just thinking of Texas makes me warm. That kind of extreme heat affects the engine, transmission, brakes and cooling system. After driving the test cars in the southwestern deserts, we modified the engine cooling system for the severe heat. On the other hand, the cold weather of Canada and the northern states can be just as hard on a car. When we saw that you put much more salt on the roads than we do in winter, we developed a heavy-duty undercoating for the car.

So how did the Audi 5000 do in its American test?

Sassor: Very well. It proved extremely durable. And we were delighted with our 5-cylinder engine. It's as powerful and responsive as the engineers said it would be. We also made a point to test the car on the roughest roads we could find to make sure the suspension could withstand them. And it did. I hope the people of New York won't be offended if I say the potholes there were some baptism for the prototype Audi 5000s. We made over 50 modifications as a result of the tests.

Why did Audi go to all this trouble?

Sassor: We're well aware of what some Americans say about imported cars: "Beautifully made, but very temperamental." We don't want that said about the Audi 5000. We feel if you want to sell it here, test it here. I believe it's the only imported car ever to be tested so thoroughly in the U.S. From what we learned, we made an excellent car even better.

On that point, we realize the current exchange rate between the Deutsche mark and the U.S. dollar. We know Americans are becoming conscious of getting good value, especially in German cars. The fact is that some German luxury cars have gone out of reach of most Americans. So we wanted to give people here a well engineered car they would like and be able to afford. We did. The Audi 5000 is the largest German luxury car for the money; it's under $9,000.*

Did your test cars cause a stir here?

Sassor: Well, you know, we took off the insignia and nameplates. So nobody knew what the car was. And it's not the kind of car that stops traffic, any way. It's quietly elegant. And very beautiful. In fact, a man in Chicago thought it was a new Mercedes prototype. We didn't mind.

*Suggested 1978 retail price under $9,000 P.O.E., transp., local taxes, and dealer delivery charges, additional. Come in and test-drive the Audi 5000 at your Porsche+Audi dealer

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Letters to the Editor

Museum of the Diaspora

Dear Sir: Reading your June cover article by Robert Wernick on Beth Hatefutsoth, Museum of the Jewish Diaspora, makes me proud that this undertaking in Tel Aviv has been successfully completed. But I write because my interest is intensely personal—my father, the late Rabbi Mortimer J. Cohen, was the inspirer of the Beth Sholom Synagogue that was architecturally conceived by Frank Lloyd Wright. The correct spelling of the synagogue is Beth Sholom and it is not a Reform but a leading Conservative congregation in the Philadelphia area.

For my father, for the congregation he established and led for more than 50 years until his death and for my family, I am proud of our place in Israel's new museum and the worthy recognition afforded on your pages.

Hedy C. Margolies
Philadelphia

Dear Sir: How on Earth could Robert Wernick not include Einstein, Sabin, Disraeli and Teller in his list of famous Jews? Bullfighter Franklin got in, but Einstein was left out. Unthinkable!

Frank Cole, M.D.
Lincoln, Nebraska

Just as the museum's gallery of some 200 Jewish faces represents a vast cross section of the world, our list was intended to show diversity and add an element of surprise. Ed.

Dear Sir: Your article states that "A few synagogues transformed into churches are all that recall the wealth and pride of Jews in Spain"—a generalization that I feel should include a little qualification.

While in Córdoba a few years ago, I saw a large statue of Moses Maimonides that had been erected by the local government in honor of this great scholar [below].

Then, a short distance from that spot, I entered and examined an ancient synagogue that was being restored. This synagogue dates from about a century after the time of Maimonides.

I have been told that the Jews used to say: From Moses (of the Bible) to Moses (Maimonides) there is none like Moses (Maimonides).

Elmer H. Douglas
Penney Farms, Florida

Dear Sir: As a history buff and student of Biblical history, I question the use of the word Diaspora for a period only beginning with the destruction of the second temple in A.D. 70.

By beginning the displays in the new museum from this date, visitors are deprived of hundreds of years of additional history of the influence of the Jews. As a grateful heir of the Judeo-Christian faith, it saddens me that the museum did

HOW WEIGHT AFFECTS GAS MILEAGE

THE SAVINGS CAN BE DOUBLED IF WEIGHT IS REMOVED IN THE DESIGN STAGE.

A designer can reduce the exterior dimensions of a car by a few inches and turn it into a major improvement in gas mileage. That's because smaller is usually lighter, and a lighter car doesn't need as much gasoline to go a given distance as a heavier one.

It's really a process of multiplication, and it works like this: once the exterior dimensions are trimmed, the bumpers won't have to be quite as big, the frame won't have to be quite as long, and so on. This saves weight, and the savings begin to multiply. Wheels, axles, as well as other components, can often be smaller.

We used the multiplier effect when we designed our current 1978 midsize cars. To illustrate how this works: if you were to take 100 pounds of golf clubs out of your trunk, you might, depending on the car, save about five gallons of gas in 10,000 miles. But if you take the same 100 pounds out of a car in the design stage, you won't need as large an engine, transmission, and other components to get good performance. So you can make components smaller and more than double the gas savings. That's what we try to do.

In redesigning our cars to take advantage of this effect, we made extended use of lighter, highly durable materials such as aluminum and plastic, adding up to an average weight-saving of 685 pounds. As a rule of thumb, this could save on the average about 75 gallons of gas in an ordinary year of driving (10,000 miles).

But weight isn't the only thing that affects mileage. Tire inflation pressures are important, so are lubricants. And an engine has to be properly maintained: one defective spark plug can knock down mileage by as much as ten percent. And remember, keep a light foot on the gas pedal; the way you drive may still be the most important thing of all.

So far, in our new resized cars, we've been able to reduce weight while still meeting all the safety standards. In these new cars more corrosion-resistant materials are used. Routine maintenance schedules have been stretched out, and the need for certain kinds of maintenance has been eliminated entirely. We've done this, in our opinion, with no sacrifice in passenger comfort or useable space in the trunk.

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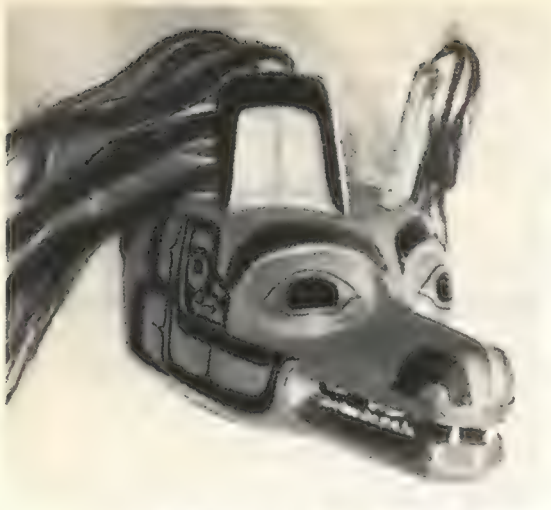

A finely carved wolf mask made by an Indian artisan at the restored Skeena village of 'Ksan.

The trip for the eclectic collector

If you haven't travelled British Columbia's Inside Passage, do it this year. It's the "Year of Discovery", honouring Captain James Cook's visit to Northwest America 200 years ago. You may find some of the rare trysts of the endangered bald eagle, see a killer whale pod, pick up a unique and valuable Indian mask, carving or gold bracelet, visit a Hudson's Bay trading post, pan for gold. But bring your camera... so you'll know it wasn't a dream. The Queen of Prince Rupert sails in every season to Prince Rupert. Send us this coupon and we'll even provide a bibliography of books to read before you come aboard. Summer or winter, our fares will amaze you. We make special arrangements for groups too! Ask your travel agent or send for our colourful kit.

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not include the Babylonian captivity.
Frances M. Church
Los Angeles

Dear Sir: The letter quoted in your article is the famous fourth letter of Synesius of Cyrene, who, while he was in later life Bishop of Ptolemais, was never, as you state, Bishop of Alexandria. Indeed, at the time he wrote this letter he may not even have been a Christian; he seems to have become one only when the people of Ptolemais insisted that he be made bishop.

Of course, some would not allow that he ever did become a Christian, this extraordinary philosopher-politician-poet-priest, but I like to think of him myself as the first "Broad Church" Anglican, well over 1,000 years ahead of his time.
John W. Kennedy jr.
Madison, New Jersey
Museum is correcting its inscription. Ed.

Brain chemistry

Dear Sir: There is an interesting but perhaps frightening parallel between the utopia of Aldous Huxley's *Brave New World* and the neurological progress envisioned by David N. Leff in "Brain chemistry may influence feelings, behavior."

In *Brave New World,* each member of the population has readily available a supply of *soma,* a wonder drug that creates in the user a pleasant, happy state of mind—in short, a "keyboard of mind and body control" to borrow the phraseology of Mr. Leff. With such an easy escape, the people are dehumanized, having lost all of their desire to confront reality.

Mr. Leff's statement that the moral implications of peptide research are profound is to me, then, an understatement of the problems that may arise in the years to come. The scientists and researchers so intent on providing us with a real *soma* will probably not be here to enjoy a world they will have helped create.
Calvin J. Cruz
Newark, Delaware

Iron Age living

Dear Sir: My enjoyment of the article by Timothy Green, "Modern Britons try the Iron Age, find they like it," was heightened by my recognition of our favorite cattle, the Dexter, drawing an oxcart.

The Dexter, currently the smallest

"There is no insurmountable physical barrier separating hungry people from food."

Earth has the physical capacity to feed its people. It's the political, institutional, and economic factors that make the problem seem intractable.

So concluded the experts in a 16-page special section on world hunger which ran in The Christian Science Monitor. The section, which explored this major world problem—and what was being done about it—is typical of the Monitor's thoughtful approach to the news.

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breed of cattle in Great Britain and of an ancient strain, would have been an authentic selection.
Donald B. Piehota
Oxford, Pennsylvania

Camping in style

Dear Sir: I want to correct an error made by Dorothy Boyle Huyck in "Over hill and dale with Henry Ford and famous friends." She states that in the late fall of 1920 the famous friends, upon leaving Yama Farms, proceeded to Woodchuck Lodge for a Brigand Steak party. This was November. John Burroughs had closed Woodchuck Lodge on October 26 and never returned. The Brigand Steak party was at Riverby at West Park. There was no snowstorm and they ate the steak, which they cooked out of doors, at "The Nest," a house rented from Julian Burroughs at Riverby. From Riverby that afternoon they went to Slabsides, where they sat on the porch. A photographer with a movie camera accompanied them and took pictures of them. I have a copy of this film—now owned by the National Archives in Washington. John Burroughs' visit to Slabsides with his famous friends —his last—was November 14, 1920.

As John Burroughs' eldest grandchild, I am his literary executor and own his journal, letters and papers. I both write and lecture about him.
Mrs. Elizabeth Burroughs Kelley
West Park, New York
We relied on Firestone's reminiscence in Men and Rubber, *but we are happy to publish the Burroughs account.* Ed.

Dear Sir: Your most interesting article about Ford, Firestone, Edison and Burroughs and their famous camping expeditions failed to include the incident, accepted as gospel in my youth, when they stopped at a country hotel.

"I am Thomas A. Edison," said Mr. Edison as he registered. "And I am Henry Ford," said Mr. Ford, next at the desk. "I am Harvey S. Firestone, Firestone Tire and Rubber."

As Mr. Burroughs stepped up to the desk, the desk clerk had had enough.

"See here, Mister," he said. "If you tell me you are Santa Claus, I am going to call the sheriff."
E. C. Wentz
Sharon, Pennsylvania

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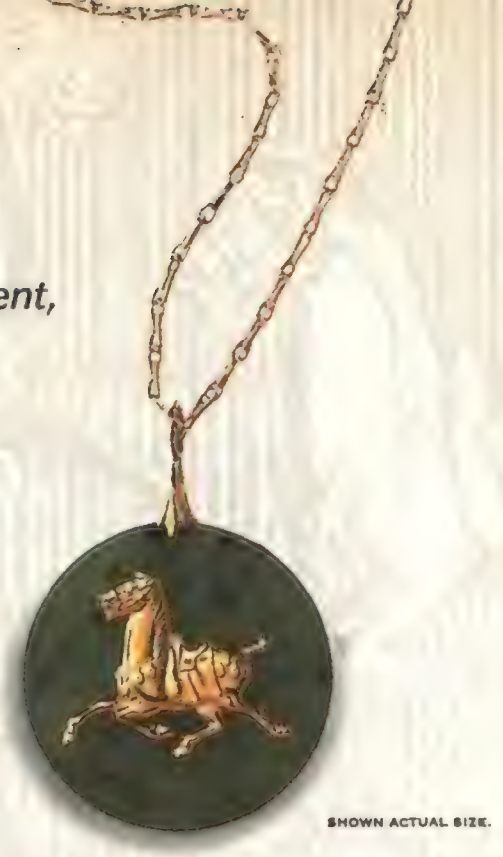

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Around the Mall and beyond

Last March, this column noted that a group of Washington artists was holding a series of studio sessions at the National Zoo. The idea was to inspire, oversee and criticize the works of visitors who cared to try drawing animals and birds.

Each of these teaching sessions was known, fashionably, as a "sketch-in." Every such activity seems to be adaptable to having "in" tacked onto it, and I suppose I show my age by not knowing why.

Anyway, the sketch-ins were so successful that the artists who inaugurated them rounded up new recruits and did it again in May (below). And then, a month later, some of them were given their own art show at the Open End Gallery, which perches over a hardware store in the old Virginia town of Middleburg.

Ed Bierly, an animal artist who used the zoo for inspiration long before the sketch-ins, said that the only way to handle the students was to *en*courage, never *dis*courage. He recalled the end of the last sketch-in when his legs were giving out and he was ready for a rest. But, as he said, "a superenthusiastic little girl came up and begged me to go with her 'just up that hill to *get* the tiger.' I panted uphill after her and when we reached the spot, she handed me her sketch pad with an appeal for help. So I roughed it out."

Bill Talkington, who is responsible for some fine bronzes, said you had to read the students carefully at the beginning and sometimes break barriers by shocking them—easier with strangers than friends. He felt kids were usually a cinch to handle. You just walk up while they're agonizing over a blotty drawing of a lion and you say, "Hey, let me show you a couple of ways to do that drawing.

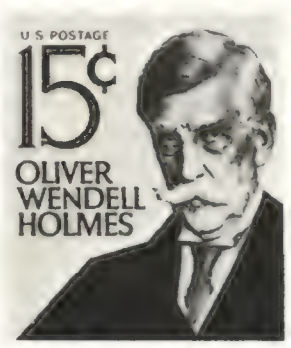
"Adults often put up a wall," Bill said. "They want to do it *their* way, and they couldn't care less about your techniques."

At the original zoo sketch-in, Talkington was doing hoofed animals. He said he'd sketch one in a few seconds, starting always with the largest part of the beast—the body—then tacking on head and neck and legs, tail, pose and attitude.

Sketchers-in (sketch-inners?) Bill and Ed were sometimes mistaken for one another because they both have beards. Kids would sometimes ask one for help on a drawing that the other one had got started. So they just took over for each other smoothly: "That's great! Now. . . ."

Artists at rest before the May sketch-in (from left, seated): Bill Talkington, John Benson, Sue Johnston, Jim Mahoney, Ed Bierly, Jay Maternis, Sue Weed, Pamela Kramer, Dianne Savage, Joyce Mulcahy; (reclining) Warren Cutler.

Those of us who have finished up our old 13-cent stamps by bolstering them with two-centers, and who have been offended by the A stamps with their placid acceptance of the likelihood of further increases, may have bought some of the existing 15-centers. These bear the likeness of Justice Oliver Wendell Holmes at about the time he left the Supreme Court in the 1930s, a fiercely mustached nonagenarian.



When I saw the stamp I recalled another portrait of Holmes that's in the National Portrait Gallery. It's a photograph —a salt print (which refers to the process used)—anonymously done in 1861. That means he was 20, just graduating from Harvard, still somewhat under the thumb of his famous father, Dr. Oliver Wendell Holmes, essayist (*The Autocrat of the Breakfast Table*) and poet (*Old Ironsides*) as well as physician.

The salt print of the younger Holmes seems as sober in aspect as you would expect in a 20-year-old contemplating the Civil War. Young Holmes enlisted right after Sumter. When he was not called up he went back for his degree and then got a commission in a Massachusetts regiment. He served three years in heavy fighting and got out because of wounds.

They say that when Confederate General Jubal A. Early led his veteran troops on a raid right up to the District of Columbia in the summer of 1864, Holmes was one of the scratched-together defenders of the capital. Lincoln went out to Fort Stevens (it's still there, on Washington's Georgia Avenue) and paced the parapets, unmistakable in his stovepipe hat.

Rebel snipers sent their bullets zinging all around the President, while a general pled with him to be careful. Then a young captain yelled at Lincoln, "Get down, you damn fool!" And that was Oliver Wendell Holmes jr., whose likeness we may have had the temerity to lick.

Right near Holmes' photograph in the Portrait Gallery is a profile of Chief Jus-

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tice Roger B. Taney. He died just about the same time that young Holmes was giving Mr. Lincoln hell.

Taney succeeded the eminent John Marshall as leader of the Supreme Court and was in the thick of the tensions over slavery (*e.g.* his Dred Scott decision). But the thing about his portrait that makes me stop and stare at it is the fact that Taney was born in 1777.

Here is an excellent photograph—as good as any today—of an 18th-century man, born a year after the Declaration of Independence. He probably could remember the excitement over the British surrender at Yorktown.

The photograph shows a tough old face, ravaged by time. Looking at it, I feel one of those strange twinges of historical awareness. I have reached back through time and touched a distant base.

Woodrow Wilson's portrait is in this gallery, too, but I saw it in a different setting. On this year's Museum Day, a date in May that entered our living rooms as unheralded as National Radish Week, the Smithsonian placed three Treasury Notes on display in the Museum of History and Technology. One of these bears an engraving of Woodrow Wilson. It is a note for $100,000, and I looked upon it and found it good.

These displayed notes are part of a huge collection of 808 pieces of paper currency which the U.S. Treasury Department passed along to the Smithsonian last spring. The notes represent nearly every issue of currency since 1861, the date of the earliest. The entire face value is $578,365.79, but most of that comes from the four $100,000 notes. These were issued in 1934 in exchange for gold turned over to the Treasury.

There was a little sipping ceremony when the notes were handed over. The Smithsonian's Assistant Secretary for Administration, John Jameson, handled all those "Gs" with visibly shaking hands, and I asked him how it felt. I was wearing unpressed khaki pants, so didn't feel qualified to go touch big money.

"It feels as though I should put it in my pocket and get out of here," Jameson said.

Fat chance. There were lots of large men around in well-pressed dark suits with an ominous bulge on the left side.

Half a million dollars doesn't seem like so very much, these days, but it still will buy you a pretty good dose of well-being. It won't, however, get you a Newport, Rhode Island, "cottage"—one of those regal mansions that rose at the turn of the century for the well-being of the Very Rich.

I checked this out in Newport while taking this column a bit beyond the Mall. The great cottages are very often open to the public for a fee—just like the great homes of Britain which "Capability" Brown dealt with and which are dealt with again elsewhere (p. 48) in this issue.

My reason for a Newport excursion was a symposium there entitled "From Religious Toleration to Religious Freedom" sponsored by Columbia, with Brown University, the Redwood Library of Newport and the Smithsonian as cosponsors. Speakers and discussants were all highly scholarly university types, so I found that the parts of the program that I sat in on were reminiscent of some good history courses that I took many years ago and enjoyed.

But beyond the substance of what was said lay the scene of the discussions. Newport, aside from its cottages, is the repository of some beautifully preserved and maintained streets and buildings, all reflecting Colonial and early Federalist days. And some of the finest of the old buildings had to do with religion and the toleration of various religious concepts.

Thus one session was held in Trinity Church, a 1725 structure allied in design to the London churches of Christopher Wren. This took care of the Church of England. Another used the United Baptist Church, and another the Sabbatarian Meeting House, which was built in 1729 and is preserved as part of the Newport Historical Society museum. At that time, Sabbatarian was the name for Seventh Day Baptists.

Finally, talks were held in both the Touro Synagogue, the oldest standing in this country, designed in 1759, and the Quaker Meeting House, the earliest of the churches here mentioned (1700) and also among the first for the Friends.

So, whatever the religious historians said from the speakers' table, there was always ample evidence all around them that there had indeed been an attempt at religious toleration in Newport. The setting reminded us all (to the satisfaction of the Newport people who took part) that the old city has a great deal more to offer than a glimpse at the vanished life of Gilded-Age millionaires.

—Edwards Park

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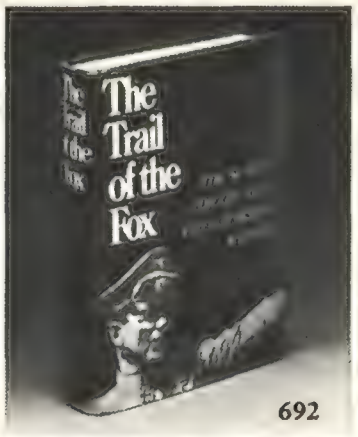

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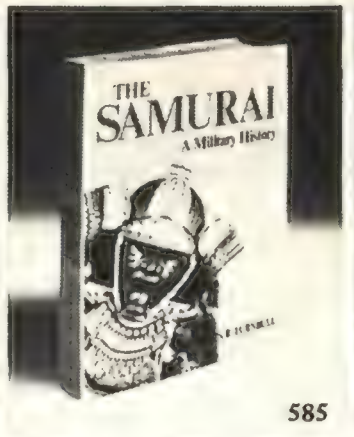

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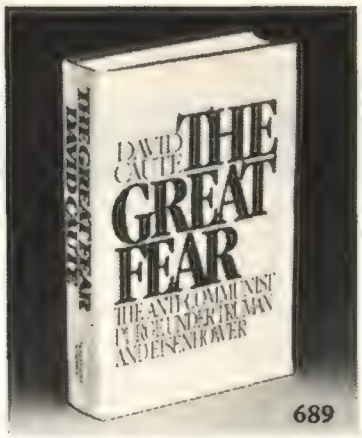

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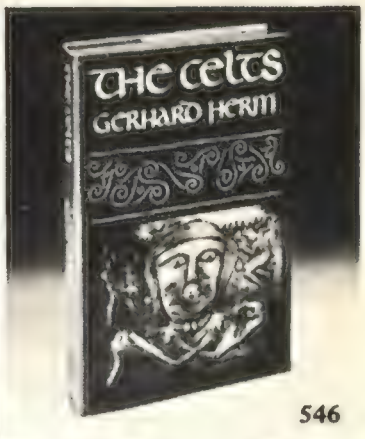

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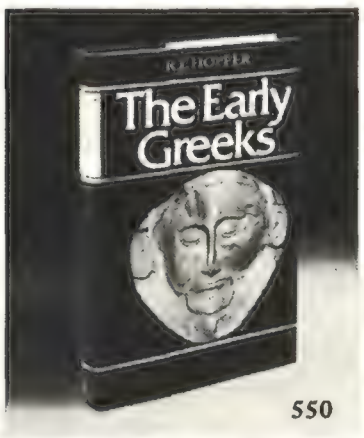

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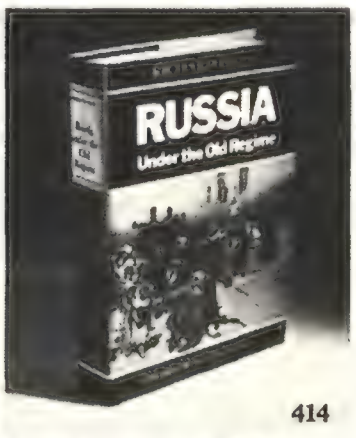

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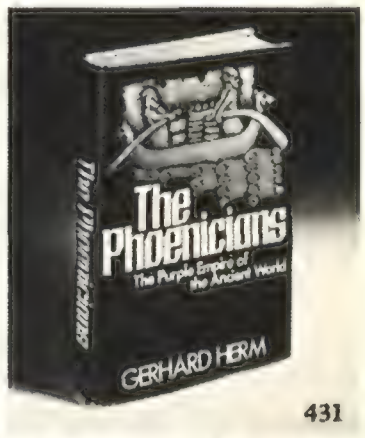

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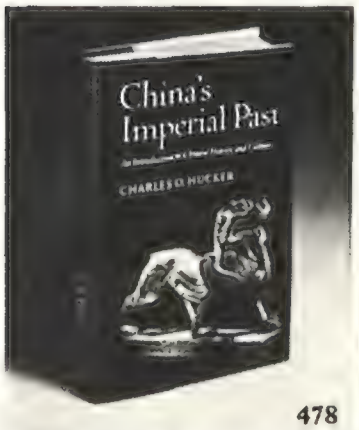

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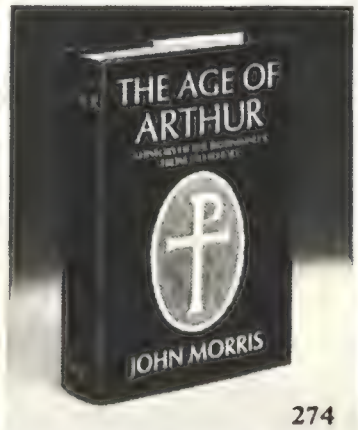

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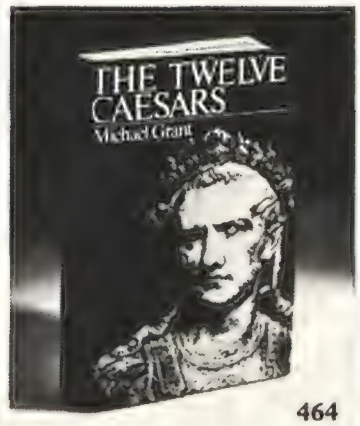

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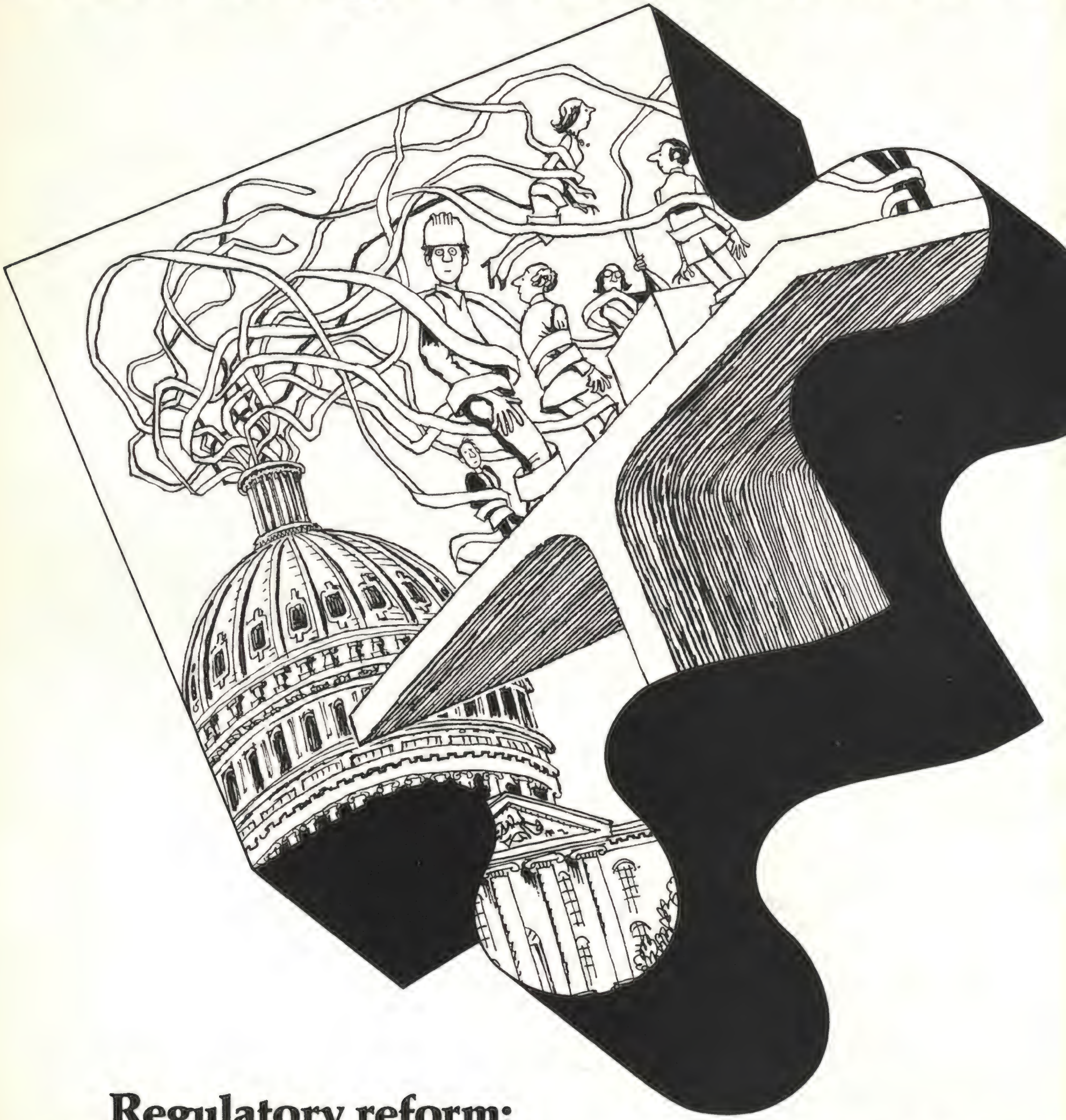

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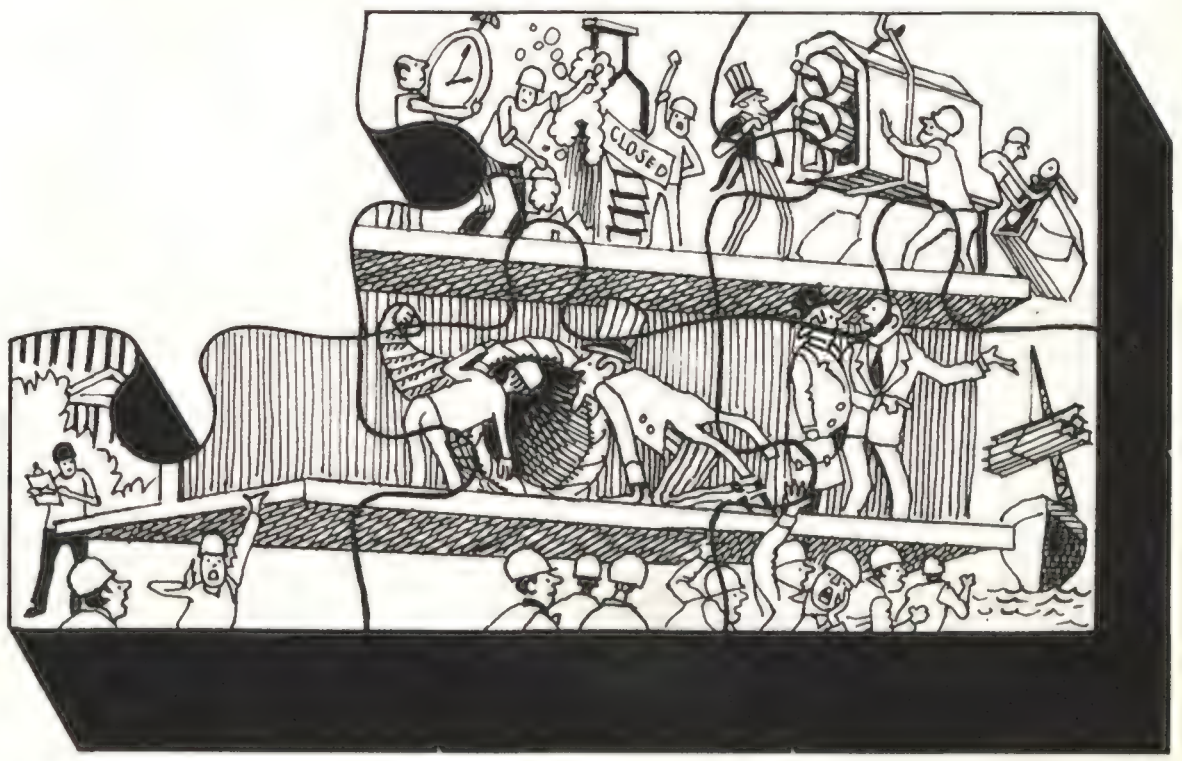

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Phenomena, comment and notes

Bronowski on science and magic, a look into a future without the printed word and Aztec cannibalism redux

Not long ago (June 1977), a grisly thesis was reported in this department to the effect that the Aztecs were cannibals on a monumental scale (250,000 people a year eaten) as a response to an ecological crisis —*i.e.*, a lack of available protein from other sources. The originator of this thesis, Michael Harner of the New School for Social Research in New York, strongly implied the existence of an unconscious "cover-up" of this horror by anthropologists and Mexicans.

As any seasoned observer of that most fractious of specialties, anthropology, knows, such a salvo will surely bring return fire, and its expected thunder roared recently in *Science* (Vol. 200, No. 4342). The artillery was manned by Bernard R. Ortiz de Montellano, a professor of science and technology at Wayne State University, who armed himself with 59 citations as ammunition. (N.B. This column was singled out as one of the targets. One can only blush.)

Professor Ortiz de Montellano rebuts Harner on several major points, including the following:

The Aztecs had plenty of protein from available vegetable crops—the familiar corn and beans and from amaranth, a coarse herb just now being rediscovered by *Organic Gardening* and the National Academy of Sciences as a source of lysine, an essential amino acid dangerously low in many vegetable diets. They also had plenty of meat—from the likes of waterfowl, armadillos, deer and dogs, not to mention reptiles and insects (yechh!).

The people of Tenochtitlán (where Harner says cannibalism was most rampant) received enough grain in tribute from surrounding territories to feed up to 150,000 people a balanced diet. Agriculture on artificial structures (Chinampas) in the surrounding lake could have fed 180,000 people. The city had, altogether, some 300,000 people. Thus it even could have had a food surplus.

More typical responses to famine (which occurred every now and then in the valley of Mexico) are intensification of agriculture and conquest. Both of these responses did occur. Chroniclers of the famines complain of people lying dead and unburied, prey to wild animals—hardly a likely situation for a society that ate human flesh out of need.

Furthermore, human flesh isn't all that proteinaceous, says Dr. Ortiz de Montellano. A 60-kilogram captive would yield a mere 1.81 kilograms of protein if the extremities (including shoulders and buttocks) were consumed, meeting the daily protein requirement of 42 people.

There *was* cannibalism, however, plenty of it, though perhaps not on so grand a scale as Dr. Harner suggests. But it took place seasonally, mostly in those months when grain was harvested and not in periods of the year furthest from harvests. Rather than a cultural response to an ecological need, the Wayne State scholar suggests, it was a form of thanksgiving. Sacrificial victims themselves believed the religious doctrine that only they along with slain warriors would go to heaven and "later be reborn as hummingbirds and butterflies." Thus, in dying, they became sacred, and were eaten in a monstrous Aztec version of the Christian Eucharist.

There will certainly be further heat, if not light, generated in this matter. Professor Ortiz de Montellano will no doubt soon be caught napping in one or another argument. A novel—for those who enjoy details of this kind of thing—is scheduled for publication next year (by Harner and a co-author). But whether the Aztecs were religiously or ecologically motivated, and whether or not one approves of the Spaniards' repressive methods of rearranging the Aztec life-style, it is no disgrace that at our present moment in the course of human civilization we at least don't do *that* anymore.

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An image slips into mind from time to time of a child sitting in a wondrously gnarled tree. There is a perfect configuration of branches a sufficient distance off the ground, creating for its youthful finder—and no one else—a splendid chair. The kid is reading a book.

Is it a drawing, a 19th-century bookplate? Or an old and now lost photograph of oneself? Or one's own daughter some years back?

In any event, the image is obliterated by an article in *The Futurist* (Vol. XII, No. 2) that spells out the progress and doom awaiting such nostalgic foolishness. The printed word on paper has been found wanting.

"Print," to use the jargon of the day, is too bulky, too slow of transmission and retrieval, and (shame!) it uses natural resources. What is in store (and, more to the point, in libraries of the future) are data bases. According to Robert F. Smith of Knowledge Industry Publications, Inc., libraries will soon be called "information centers," librarians "information scientists." Card catalogs, bibliographies, even the information contained in all of the citations in the bibliographies, will be immediately retrievable from tapes read out on video screens.

You will be able to take out what used to be an illustrated book in the form of a video disk. Magazines may have to make the transition to electronic publication.

This is all very well, of course. More information more specifically targeted to ever more rapacious appetites for the absorption of an ever-expanding data base. If Mr. Smith hesitates to spell out the social and individual implications of this expansion of data-retrieving capacity (which he does), then certainly this column is no place for such speculation.

Instead, an incident of the present for futurists to ponder in moments between bouts of euphoria: a Harvard economics undergraduate sought relief from the dismal science recently in that fine information center called the Library of Congress, whereupon he grew interested for some reason in the manufacture of atomic bombs. Before long he emerged from the information center with a 400-page report on the subject. Upon discovery of the report, the Department of Energy said the student not only could not keep this result of his research (unless he installs a

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safe and alarm system), but could not discuss it. In fact, the department would not even tell him which paragraphs were classified, that being classified information itself.

Last words

More than a decade ago, a very small man took command of a large proscenium stage in the American Museum of Natural History. He was armed with nothing visible but a dinner jacket and a few bits of paper sprinkled on a table he would from time to time lean against in the midst of a modest gesture. And over four nights he lectured a full house on the connection between the arts and the sciences. C. P. Snow had just warned of the widening gulf between the two cultures. The little man, talking as if extemporaneously, and occasionally taking the slips of paper off the table to read an apt quote, knotted the two cultures together as firmly as they had ever been knotted. In the minds of those in the audience, the two cultures have never been very far apart since.

This was Jacob Bronowski, who preferred to be known as J. Bronowski. He was, at that time, a philosopher, scientist, mathematician, minor poet, administrator and literary critic. Like Conrad, he was a Pole who had mastered the English language better than all but a few native practitioners (see his article on Copernicus in the April 1973 issue of SMITHSONIAN). What most people in the audience did not know was that Bronowski was a supremely accomplished actor.

He delivered four lectures just as though he were thinking each thought for the first time: pausing for the *mot juste*, the hand lightly touching the high round brow in encouragement. He spoke, however, word for word from a memorized manuscript, already in the process of being published as a book, *The Identity of Man*.

A lot of people resented Bronowski, as only a wanderer from one carefully delineated field can draw resentment. He was arrogant. He was also an actor, a popularizer. Many more people saw and heard him when the BBC program *The Ascent of Man* went on American public television, having been aired first on these shores to standing-room-only crowds at the Smithsonian. (When Bronowski appeared to discuss his film, he drew the

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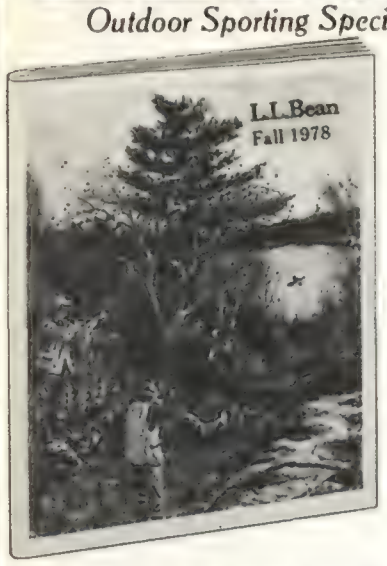

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J. Bronowski and a verbal opposite

largest crowd of all.) Then, a little while ago, he died of a heart attack.

But not quite died. There is a little more Bronowski left. It is a book called *Magic, Science and Civilization* (Columbia University Press), the posthumous outgrowth of yet other lectures that no doubt sounded equally spontaneous during their delivery. Magic, he wrote, has to do with power; science is inquiry. "Magic is a technology without science." Magic conjures up prestidigitation or voodoo, he would admit, but much worse, it is the assertion of a mindless belief, like a horoscope or the "classification" of the obvious knowledge of a generation about atomic weaponry, a failure to attend to fact. Magic is propaganda, an attempt to "command the world and particularly the opinions of other people by some formula which is other than the truth. ... The central opposition between magic and science is the opposition between power and knowledge." Magic and true belief. Science and inquiry. What is the path of knowledge?

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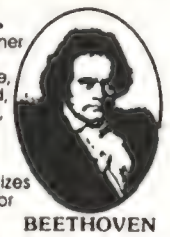

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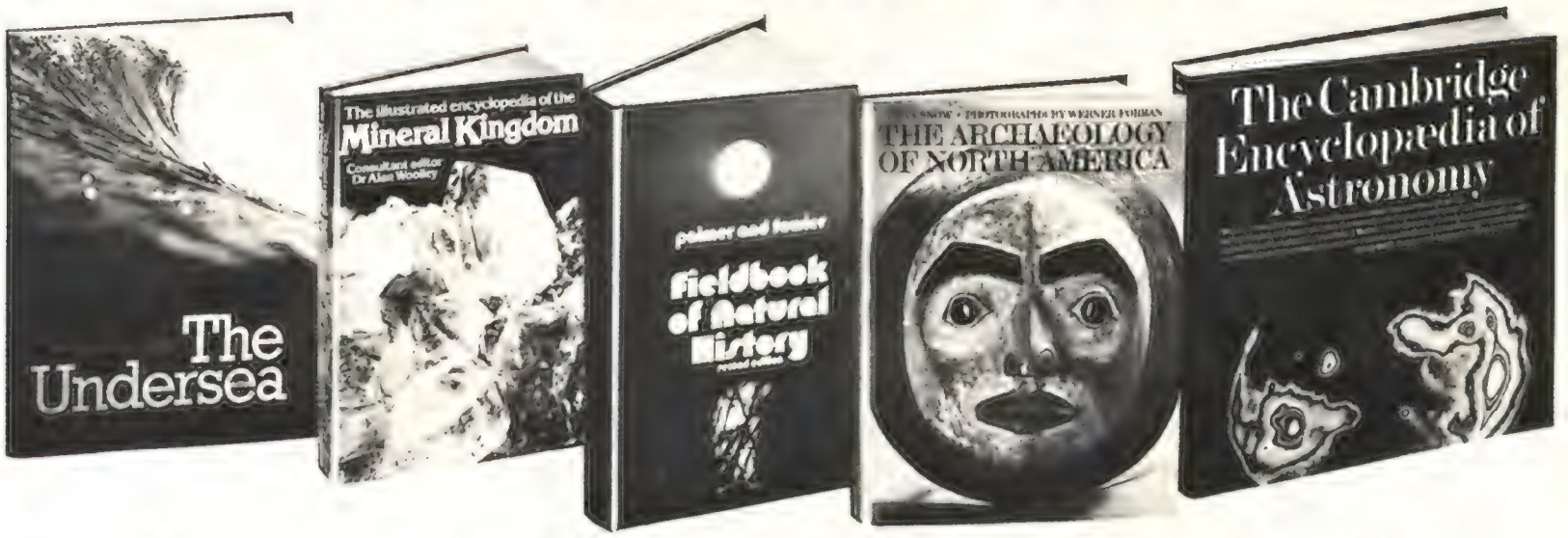

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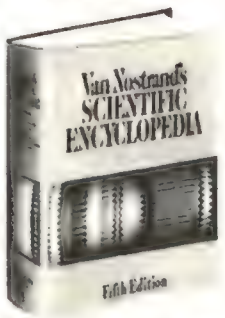

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By Peter F. R. Jackson

Scientists hunt the Bengal tiger– but only in order to trace and save it

Searching for tigers, David Smith and Nepalese tracker examine the pugmarks on a Chitawan road. In background are scientists' off-road vehicles—two elephants belonging to Smithsonian Institution.

In Nepal, Smithsonian project uses tranquilizers and techniques of radio tracking to learn how much room the endangered cats need to survive

The rifle barked, and with a loud "oof" the tiger crashed through the undergrowth. Then there was silence. Ten minutes later my elephant pushed through the tangled jungle, and a patch of red-brown, black and white caught my eye—the tiger was lying on its side at the base of a tree.

But this is not an old-style hunting story, for this time the recumbent tiger was not dead but asleep, tranquilized by a drug-bearing dart. And the darting itself was part of a study, supported by the Smithsonian Institution and the World Wildlife Fund, that has been going on for five years now in Nepal's Royal Chitawan National Park. There, American and Nepalese scientists are hoping to learn enough about the ecology of the tiger to make sure that the great cat has a future on this planet.

The world population of tigers, estimated to be about 100,000 at the turn of the century, is only some 4,000 today. Of the eight regional subspecies of tiger, the smallest, the Bali tiger, is extinct, and so possibly is the Caspian tiger, which once ranged from Afghanistan to eastern Turkey. Only four or five Javan tigers still live in the wilds. The Sumatran tiger numbers a few hundred, the Chinese tiger a few individuals, and the Siberian tiger of north Asia perhaps 250. It is estimated that about 2,000 Indochinese tigers survive, and the number is probably similar for the Indian or Bengal tiger, the subspecies to which the Chitawan animals belong.

The dramatic drop in population is in part due to

hunting, but primarily to loss of habitat because of human occupation and activities. At Chitawan, scientists like David Smith, the principal investigator, are tagging tigers with collars bearing small radio transmitters so that their movements can be followed. The data thus collected may shed light on questions bearing on the animals' survival. Can the ecosystem on which tigers depend stand up under the human pressure around a national park? What is the best way to manage Chitawan and its wildlife? What is a tiger's territory and how far does it range? The answers will help preserve the animal in Chitawan and in other reserves as well.

Early on the morning of our hunt in Chitawan, a wiry young Nepalese tiger tracker scrambled up the riverbank and reported to David Smith: "Tiger has killed, sir."

Dave had been waiting for two weeks for news of a kill. Every evening young buffaloes had been staked out by the paths where he had found the pugmarks of a tigress with three cubs. Dave had chosen the baiting sites carefully, so that they were near an extensive grass area into which he knew the tigress would drag her kill. At the eastern end of the clearing were trees from which he could fire the tranquilizing dart.

With news of the kill our camp sprang to life. Four elephants lumbered up and knelt as we scrambled onto their padded backs. With a seismic upheaval, the elephants rose to their feet and we clung to our equipment—tranquilizing gun, case full of drugs, tools, radio equipment and cameras.

Within a few minutes of leaving camp we fell silent —if you want to see the life of the jungle, you don't make a noise. Our elephants waded through streams, padded over sandbanks and swished through the tall grass that reached high above our heads. There were new tracks—a rhino had passed, so had deer, and there were fresh tiger tracks.

The sun rose above the hills, lighting the distant snows of the Himalayas to the north, and with its warmth the morning mists dispersed. We skirted the grass where we knew the tigress was lying and reached the trees. Dave climbed into the branches of one tree and I perched in another nearby. Prem Bahadur Rai, chief shikari or tiger tracker, led his team away on the elephants. And then there were only the jungle sounds —the strident "kaan" of a peacock and the monotonous "krrr, kekrrr" of a barbet.

Prem Bahadur and his men were preparing to push the tigress toward Dave's tranquilizer gun. Prem Bahadur knows tigers and the technique of catching them as

Peter F. R. Jackson lives in Morges, Switzerland, where he serves as a special coordinator of Operation Tiger for the World Wildlife Fund.

As a darted tiger sleeps off the tranquilizing drug, Smith, center background, scans area with radio antenna. Another radio-collared tiger is thought to be near, and Smith wants to avoid confrontation.

Photographs by D. Luke Golobitsh and Peter F. R. Jackson

To lower Chuchchi's temperature after darting, Smith and helper wet her down with bucket of cool water.

One of Smith's colleagues straps on a collar containing small radio

well—as a shikari for the royal family of Nepal for 35 years, he conducted many beats for kings and princes before tigers were given royal protection. Now he supervised as several hundred yards of white cloth were unfolded and fed through the grass and bushes to form a widemouthed funnel. The trick was to arrange the cloth so that only odd white patches were visible; these would make the tiger cautious and guide it in the desired direction. Curiously, a tiger will not jump over a strip of cloth only three feet high.

At last we heard shouting: "Hey, hey, bagh, bagh, tiger, tiger. . . ." Now the beat had begun. The shikaris on their elephants were on the far side of the tigress and her cubs and they started pushing toward us through the grass. The tigress was still unseen, but we could guess how she was reacting. She would prick up her ears at the loud noise, stand and look around, trying to localize it. Then, leading the cubs, she would walk away from the disturbance, pausing from time to time in puzzlement.

As the shouting got closer, Dave, at the neck of the funnel, was tense. The tigress should appear in a small open patch in front of him—and there she was!

Bang! And the dart lodged in the tigress' flank.

Two tiger cubs streaked beneath me and disappeared, and the mother bolted off, too. We hurriedly remounted our elephants and started to hunt for the tigress. The jungle was thick on the broken hillside and we knew only roughly where she had gone. Usually a tiger goes only about 200 yards after darting, and then often turns back, as though trying to make out what happened. At that moment the drug takes effect and the tiger drops.

We thrashed around frantically in the undergrowth, and then I spotted the tigress lying at the foot of a tree. Dave and the rest of the team were quickly on the spot. She was laid out comfortably, a grass pillow was placed under her head, a bucket of water was brought up and her beautiful striped pelt soaked to bring down her body temperature (above, left), which may rise when an animal is under the influence of the drug. A thermometer reading showed her temperature quickly returning to normal.

A check was made to see if the tigress was carrying any parasites—mites and ticks in the ears and the fur of the ruff. But she had none and was clearly in an excellent state of health. Then she was marked for life—the number 115 was tattooed in her earflap. The 100 series is reserved for tigers, and this was the 15th to be collared. (Each of the species being studied in Chitawan,

transmitter. Lithium batteries will keep it going for about five years.

As she revives, Chuchchi, now wired for sound, lifts head to look around. Collar weighs 1¼ pounds.

such as prey animals, is assigned its own identifying numerical series.)

As preparations were made to put on the collar, a new figure arrived at the scene—Dr. Charles MacDougal, director of operations at the Tiger Tops tourist lodge in Chitawan. Chuck MacDougal has been carrying on a private study of the park's tigers for six years; the project investigators have appointed him a consultant because of his deep knowledge. For him this was an interesting moment because the tigress was none other than Chuchchi, and he told me her story:

"Chuchchi has been around since we came here in the spring of 1972, but, unlike most tigresses, she would not stay to eat the bait if she couldn't drag it away. It was difficult ever to get an unhurried look at her. Our shikaris christened her Chuchchi, which means 'The One with Pointed Toes' in Nepali. Most tigresses have pointed toes, but she has particularly small feet and in certain kinds of ground her central toe projects noticeably far forward.

"I met her once, though I only knew later from her track that it was Chuchchi. I was out looking at birds up on a ridge when I saw a flash of red which resolved itself into a tiger, facing me, crouching down, about 15 yards ahead. She just looked at me, and I looked at her. Then it dawned on me that maybe she was waiting for me to make the first move. So I took a step back, but on the knife-edge ridge I had to turn around and walk away from her. She didn't follow."

Dave was now ready to put on a radio collar made of tough plastic. At one and one-quarter pounds, it is designed to equal less than one percent of the animal's total weight. The collar carries a small radio transmitter. "Each one works on a different frequency and that's how we identify the individuals we are tracking," explained Dave. "Our receivers can pick up about 200 different frequencies and so we can handle a good number of tigers, deer and other species."

Dave measured Chuchchi's neck to ensure a close but comfortable fit. Then the collar went on, the bolts were secured with epoxy resin and the joints taped.

A few yards away shikari Bir Bahadur switched on the receiver and through the headphones we heard Chuchchi's signal beat like a smacking kiss: "tch . . . tch . . . tch . . . tch. . . ." No longer would she be so elusive.

Chuck pulled out his notebook and began to sketch the black lines on Chuchchi's white cheeks. Each tiger has a different facial pattern and so can be identified on sight. Dave then held up Chuchchi's head for "mug shots" (p. 32) for her file. After making her comfortable

To record pattern of facial stripes—unique for each tiger—David Smith holds up Chuchchi's head for photograph. The tigress' eyes are still glazed from tranquilizing drug, but soon she will recover.

on the ground, everyone withdrew to allow her to recover. Everyone, that is, except Dave and me. We sat quietly behind a tree a few yards away to see that when she started to move she did not fall and hurt herself and to ensure that she was not attacked by a passing tiger or hyena while incapacitated.

While we waited, Dave talked about his studies, which are focused on how tiger cubs disperse as they grow up and how they establish their ranges. "What are the basic requirements in a dispersal route?" he asked. "What would be an adequate supply of prey and an adequate supply of cover? In what circumstances does a tiger settle down? Do some remain nomadic? Do male and female dispersal behavior differ? How can possible conflicts between tigers and Man and livestock be reduced?

As population grows, space runs out

"Some interesting observations are emerging. Tigress 101 was the first female collared and she allocated part of her territory to her daughter, 103. This was surprising, because 101 is a very, very large tiger and yet she moved out while 103 was still quite young and quite a bit smaller. Now we have an interesting situation, because both 101 and 103 have cubs, and I don't believe there is going to be room for both 101 and 103 to allocate territories to their young.

"Males are not allocated territories. Tigers are polygamous, and a single male will control a home range that includes three or four females. Tiger 105 is a very big tiger, more than 600 pounds, and he controls seven females. So the subadult male is forced to move in a peripheral area, or to disperse and wait in the wings for several years until he can establish a territory. We hope to find out just where the subadult males are going, what sort of existence they have—whether they are just barely hanging on—and then find out if they do move back to take over the place of the resident males when they get older."

Our low-voiced discussion was suddenly interrupted by the noise of Chuchchi stirring. We peered round the tree. She was holding her head up (p. 31), pupils dilated, obviously trying to focus her eyes. With a big effort she rose and stumbled a few steps, but quickly collapsed and lay still.

After a while Chuchchi again staggered up and disappeared clumsily into the grass. We waited until all was quiet and then Dave crept around to see where she had gone.

He called softly for me to follow—Chuchchi was sitting regally on the edge of a ravine, a paw draped over the edge. She saw us but was indifferent. She was clearly recovering well and, as the evening was drawing on, we decided to return to camp, leaving two

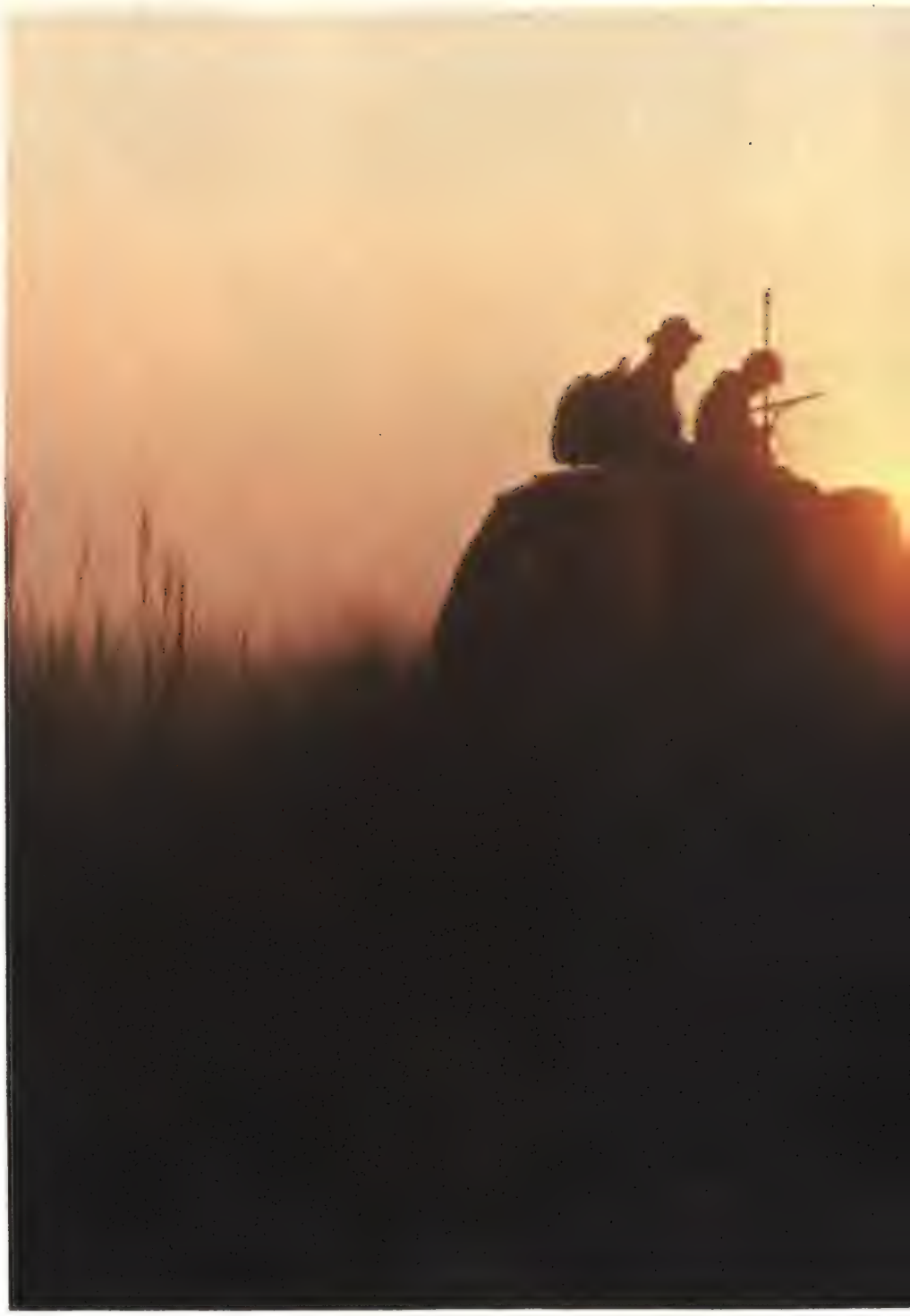
After a successful collaring, research team gathers for group picture with still-wobbly tiger 113.

shikaris nearby to ensure her welfare during the night.

Tigers often return to the kill the same night that they are darted, which indicates that they do not associate the bait with the darting experience. And there is no sign that the collar is an irritation or otherwise affects the animal's life. If it did, it would reduce the value of the study.

Chuchchi's three cubs—Dave estimated them to be about seven months old—were probably not far away and would almost certainly rejoin her during the night. In my tent, in the small hours, I heard the distant roar of a tiger repeated several times: "Aowaan, aowaan, aowaan." Was it Chuchchi calling her cubs? Perhaps, but we knew that there were other tigers moving in the area.

At dawn we went out to check on Chuchchi, operating the radio antenna from elephant-back. The receiver picked up her signal and told us that she was



Their antennas at the ready, researchers set forth at dawn on elephant-back to track collared tigers.

still in the ravine area. Dave crept off by himself to get a look at her and to be totally assured that she was in good shape.

As we rode back to camp, a shikari heard the signal of 105, the big male, and we found his huge footprints. That evening, as we sat around the campfire in the moonlight, 105's signal was again picked up. By pointing the antenna in the direction of the loudest signal, we located him north of our camp, probably a few hundred yards away.

The antenna followed him around the camp. As he walked through dips in the ground or behind a tree, the signal missed a beat or two or weakened. The shikaris suddenly sniffed the air. There was certainly a faint tiger smell on the breeze; 105 might have been quite near. But the signal revealed him to be walking on and it faded out toward the hills. Next morning we learned that he had taken one of the buffalo baits at Tiger Tops, several miles to our west.

Radio reception on the ground is limited by terrain, and whereas signals can be picked up at one to two miles in open grassland, they may carry only a half-mile in the dense forest. But from the air, radio tracking can be carried out from distances of 15 to 25 miles. So next day we went aerial tracking with Swiss pilot Hardy Fuerer, who flies for the United Nations Development Program in Nepal and is ready to help Dave whenever possible.

The antennas were strapped to the wing struts so that they were at right angles to the fuselage. Dave held the receiver on his lap and flipped through the frequencies. Within 20 minutes he was able to locate nine of the radio-collared tigers, as Hardy neatly maneuvered the aircraft so that each signal was received at maximum strength. At that moment the wing pointed straight at the tiger.

The accuracy of this method was demonstrated as we swept down to treetop height, air brakes out to slow our speed. We banked right and Dave yelled: "There! Four tigers."

Sure enough, down the line of the starboard wing lay a tigress, number 107, with three cubs scattered around her. We made three low passes to take in this exciting scene. The only disappointed man was Hardy; once again he had been able to show Dave tigers from the air, but *he* still had not seen one—he was too busy controlling the aircraft.

To Dave this flight demonstrated once again the value of aerial tracking. "A light aircraft is a primary tool," he said, "because a tiger's home range is usually so extensive. For instance, tiger 105 has traveled 24 miles in 11 hours. On the ground, reception is limited

The signals do not carry far through jungle at ground level, and trackers sometimes work from airplanes.

and we can search for days for a single animal. One tiger was missing for seven months, but we located it and three others in 11 minutes on our first flight."

The warden of the Chitawan National Park, Jamuna Tamraka, dropped by our camp one evening and we talked over the story of the park and its problems. This whole valley of the Rapti River in the Himalayan foothills was once prime tiger jungle and the favorite hunting resort of the kings of Nepal, he explained. A deadly form of malaria kept human settlers out of Chitawan and the belt along the foot of the Himalayas called the *terai* until the 1950s, when DDT brought mosquitoes under control. Then people from the hills moved down to the fertile land, clearing the forest for agriculture. Wild animals were killed indiscriminately and their habitat destroyed forever. Happily, royal interest in Chitawan remained, and the former hunting preserve was declared a wildlife reserve and later proclaimed a national park covering 210 square miles.

The World Wildlife Fund provided assistance for vehicles, workshops and equipment for protection and management of the park, while the United Nations Food and Agriculture Organization (FAO) sent in park-management specialists to help the Nepalese authorities establish a sure foundation. Domestic livestock, which destroy habitat by overgrazing, have been kept out, and other human disturbance, such as woodcutting and grass collecting, has been curbed. Recently the Frankfurt Zoological Society in Germany provided funds to extend the park so that it will cover 350 square miles in all.

Through tiger country by dugout canoe

Dave and Chuck wanted to have a look at the new western extension, and so one day we paddled down the broad Narayani River in dugout canoes, passing great flocks of ducks, egrets and waders, while eagles and storks circled overhead. Here and on the mudbanks were basking crocodiles—muggers and critically endangered gavials, slender-snouted reptiles for which Chitawan is one of the last refuges.

At sunset we camped at the mouth of a small tributary and next morning started trekking upstream. We soon found tiger tracks, and Dave and Chuck bent over them with their rules to measure them. The pugmarks often have special features, as Chuchchi's do, and Chuck quickly recognized these as the tracks of a tiger which had visited Tiger Tops.

For two days we wandered slowly upstream and over ridges through lush jungle, where giant sal trees (*Shorea robusta*) towered above the bamboo, ferns and tangled undergrowth. There were pugmarks of only two tigers, but we saw tracks of sambar deer and of gaur, among the largest of the wild cattle. We found a sambar half-eaten by tigers, and Dave struggled amid clouds of flies to cut out the lower jawbone. From this he would establish the animal's age by sectioning the teeth and reading the growth rings, just as in aging a tree. The sambar and the chital (spotted deer) are the main tiger prey.

Dave was not too worried that this area did not seem to be prime tiger habitat. "These suboptimum areas are likely to be of crucial importance," he explained. "There are about 50 tigers in the extended Chitawan Park, and at the rate young are being produced, the park will not be able to hold them. Mel Sunquist, who worked here until last year, found that subadult males just leave at about two-and-a-half to three years of age.

I want to find out where they go. I think the periphery of the park can be of vital importance to the population as a whole—it may give the subadult male an area where it can hang on.

"I mentioned that 101 and her daughter 103 both have cubs now, and even if *they* find space, there sure won't be enough for the next generation. So I think females also will be forced into suboptimal areas where it may be difficult to raise litters. Still, they will act as a surplus population which can provide individuals to fill vacancies in the optimum habitat.

"Perhaps all will go well in central Chitawan for 25 or 30 years, and then, as a result of chance events, several females may either die or become incapacitated and unable to raise young. Then this surplus population in the peripheral areas can move in and act as a damper to prevent fluctuations in tiger population in the prime habitat area.

"These suboptimal areas may be adjacent to national parks and there may even be forestry operations going on, but as long as there are prey populations and suitable habitat, tigers can live there. This is important too for gene-pool management. We do not have evidence as to what is a critically small population for tigers, but we do know that small populations can cause genetic problems and are extremely subject to chance events.

"The peripheral areas may also act as corridors between reproductive areas, and even if they are very, very suboptimal, I think we shall have accomplished a lot if we can keep them."

The research at Chitawan represents only part of an effort to save the tiger before it is too late. In 1969 the International Union for Conservation of Nature and Natural Resources (IUCN) declared the tiger an endangered species and called on all nations with tigers to protect them. The World Wildlife Fund, which works in close association with IUCN scientists, launched an international appeal for funds to carry out a plan called "Operation Tiger." Nearly two million dollars poured in, enabling the Fund to purchase vehicles and field equipment, to train park staffs and hire researchers, to combat poachers, and to control fires which can sometimes devastate large areas during the dry season.

Much of the effort has been concentrated on the Bengal tiger in India, Nepal, Bhutan and Bangladesh. Here it appears that the decline has been halted, and maybe even reversed. Apart from Chitawan, Nepal has two other tiger reserves, and India, where Operation Tiger is part of the country's five-year development plan, has 11, including a joint one with Bhutan. Indeed, in India's Rajasthan State, 16 villages are being moved to make room for tiger reserves, the people compensated with more and better land than they had possessed before.

Of course, some people question saving the tiger on the grounds that it is a dangerous animal. Because of its size it certainly can be, but attacks on human beings are usually the result of encounters in which the tiger is taken by surprise and possibly cornered. A blow from a tiger may well prove fatal, but in such circumstances the normal tiger does not treat the human as edible prey. Man-eating usually occurs when a tiger is disabled—perhaps by a porcupine quill lodged in the pad or a gunshot wound—and it discovers that humans are easy prey. Some tigers become cattle killers, but this is uncommon so long as they can find sufficient natural prey.

People have coexisted with tigers for thousands of years, and the Chitawan radiotelemetry studies have shown how tigers and men go about their business in close proximity, avoiding one another when necessary. An Indian friend once recounted to me how he watched a tiger walking along a road when some men on bicycles appeared. They dismounted and stood quietly as the tiger walked past. Afterwards he asked them if they were not frightened.

"No, sahib, that tiger was deep in thought," one of the men replied.

Never again will the tiger roam freely except in protected areas like Chitawan. But we are becoming increasingly aware that variety is essential to maintain the dynamic balance of nature and life, which includes Man. As Chuchchi slips through the jungle, the "tch . . . tch . . . tch . . ." of her radio will help us make the right decisions for managing her future and ours.

Her three cubs invisible nearby, tiger 107 becomes aware of spotter plane that has picked up radio signal.

With the 32 finalists sitting at their feet, the members of the President's Commission on White House Fellowships gather on a patio at the start of three days of casual shoulder-rubbing and intensive interviewing. Chairman John W. Gardner is seated front and center.

Photographs by Yoichi R. Okamoto

By Richard L. Williams

Highest, hardest achievement for 15 high achievers

In a bucolic but rigorous and tension-filled weekend, candidates for White House Fellows are passed or flunked by high-level judges

Q. *What makes you angry?*
A. *Who says I'm angry? I'm not angry.*
Q. *What I'm trying to get at is, what makes you tick?*
A. *Well, I'm not ticking either. But I get what you mean....*
Q. *Assume you're at work on the job. Your assignment, right now, is to draft a speech the President has to make before a Jewish group, defending the plane sales to the Arabs. How do you go about it?*
A. *Um. Well, I start by swallowing hard. And then....*

Having survived Q. and A. encounters like the above, 15 fresh faces, from nearby and faraway places, will show up in Washington next month to start anything-but-faceless jobs in the generally faceless national bureaucracy. Prestige jobs, even cushy ones, their parents might say. Nice work, anybody would say, for these neophytes (hardly kids, their average age being 31.2) will begin their yearlong government careers earning—in some cases—as much as a civil servant gets at GS-15 Step 3, federalese for $38,583 a year.

They are the 15th and current annual crop of White House Fellows, and their assignments to various Executive Branch departments and to the President's and Vice President's own staffs will carry high-sounding titles, such as special assistant to a Cabinet secretary. Thus they start out close to the top. In the months to come they will be invited out a lot, will have seminars with statesmen, and will learn quickly how to dress and talk in Washington social and political circles. They will not become instant decision-makers, but rather will be mascots to those who are. For a year they will be close to the seats of power, witnessing and possibly even helping to shape great events. Yet all this, heady as it may sound, will seem to them somewhat anticlimactic until a fateful spring weekend recedes in their memories.

It was their "selection weekend," the culmination of a long and painful process. Two thousand twenty-six people of all regions, races, sexes and many professions filled out the lengthy and demanding Fellowship applications last fall. One hundred and ten were picked by the Civil Service Commission to appear before a dozen regional panels. Thirty-two survived that gauntlet and were invited for the long weekend, out of which came the 15 Fellowship winners—and 17 disappointed losers.

A lot rides on that time of trial. A White House Fellowship is no guarantee of lifelong, ever-ascending success, and all it is supposed to do is familiarize some outstanding men and women, early in their careers, with the workings of the government they live with, believe in and want to help function better. But it is a pretty good ticket, like being—given a decade fewer years—clerk to a Justice of the Supreme Court.

The roster of 199 former Fellows (14 more are serving currently) includes college deans, corporation heads and investment executives. Tom Johnson was a 23-year-old reporter on a Macon, Georgia, paper when he was selected ("I didn't think I had a chance") for the first class of Fellows in 1965. He worked at the White House itself, helping then Press Secretary Bill Moyers; when President Johnson, no kin, retired, he took the young man along to help run the family communications empire in Texas. Today, Wyatt Thomas Johnson is president and chief operating officer of a much bigger empire, the *Los Angeles Times*. He is also a member of the President's Commission on White House Fellowships, as is his classmate Michael H. Walsh, now U.S. Attorney for the Southern District of California. The fact that they were once ground through the selection mill themselves gives them some added understanding, but it does not make them any easier on those they grind.

"This selection process," says Johnson, who should know, "is more intense than that for the White House staff itself." He did not mean it as faint praise. "The one thing we look for in these candidates is the promise of achievement."

Of course all the finalists are high achievers for their age and career status. They are, at least outwardly, impressively self-assured and most articulate; it would

The author, of the SMITHSONIAN *Board of Editors, wrote the 1977 articles on the Supreme Court.*

Flanked by pairs of finalists, Commissioners Susan Herter and John Brebbia make small talk

appear that shy violet types, introverts or loners should apply elsewhere. Likewise those who are too Clark-Kent-square, or too brilliantly zany.

Traditionally, the climactic spring weekend, when the President's Commission observes the candidates collectively, singly and very carefully, has been at gracious Airlie House in the horsey Warrenton, Virginia, countryside. This year Airlie has been under a cloud because of some alleged Congressional shenanigans involving its operating foundation. The meeting was moved to the equally suitable Cross Keys Inn at the Maryland "new town" of Columbia.

The Commissioners arrived first, to be reminded at breakfast by ex-Fellow Landis Jones, the establishment director, that few Fellows in recent years have come from the South, that President Carter would like to see more women and minority people as Fellows, and that finalists must not be asked any sexist questions. The Commission was sued a few years ago by a female psychologist who claimed she had been discriminated against. The action never went to trial, but no woman candidate nowadays is supposed to be asked "Who's going to look after the children if you come to Washington?" unless every father in the group is asked the same kind of question.

Trailed by a Secret Service man, and toting hefty dossiers, Gardner heads for interview room.

Among the 32 who went to Cross Keys Inn were ten women, including one black (three were going to make it, but she was not among them); six male blacks, of whom three would survive; and three Hispanics, of whom two would pass. There were doctors, lawyers, a nutritionist, two military officers, corporation "comers." One finalist was up for the third time; he would lose again and probably not try for a fourth round next year. The youngest was 26 and the oldest 41. There is no longer a 23-to-35 age bracket because that seemed discriminatory. But the Commission hews to its early-in-career standard because the Fellowships are not supposed to reward a lifetime of outstandingness, but to enhance the chances of one.

On the surface, everything out at Columbia was as relaxed as the judges and the judged could make it,

on the poolside terrace at Columbia, Maryland, during a break between interview sessions.

Lady Bird Johnson pays close attention as a candidate tells why she wants to be chosen.

Commissioner Michael Walsh, once a Fellow himself, fires off some sharp questions.

Commissioner Barry Bingham, chin in hand, waits while a candidate ponders an answer.

for all the underlying strain on both. The finalists took their meals informally with such notables as Common Cause's John W. Gardner, the chairman, who as president of the Carnegie Corporation proposed the Fellowships (he wanted 100 people a year) to LBJ 14 years ago; Lady Bird Johnson, from the first a devoted supporter of the program; and former Pennsylvania Governor and U.N. Ambassador William W. Scranton. The hopefuls mingled with their selectors at cocktail hours on the patio, trotted with some of them along the jogging paths and exchanged small talk with them at coffee breaks and around the swimming pool.

But the chips-down interviews were something else. In a dozen rooms off the inn's long, dark hallways, pairs of Commission members interrogated the 32 candidates one at a time, for 25 minutes, a total of some 300 minutes of solo examination each. The questioners were armed with thick loose-leaf dossiers, including the results of minutely detailed Civil Service "full field" investigations that had dug up everything about a candidate that was remotely relevant and, inevitably, some information that was not.

"There are no specific established criteria to ascertain whether a person is eligible or not," said a fact sheet that had been handed to each Commissioner. But there were factors to be used in judging: "outstanding leadership ability. . .initiative. . .professional

excellence. . .community or other involvement. . .commitment to the quality of life. . .integrity. . . ."

The finalists, on the other hand, were armed only with name tags on their chests and whatever was in their heads. No briefing papers, no notes, and when they had two interviews in a row, only five minutes for catching the breath in between. Facing them, in two-against-one confrontations, some of the Commissioners displayed soft-spoken, easy-going, I'm-on-your-side personalities. Others at times came on strong, like Perry Mason or, to their witness-chair targets, even like tormentors of the Inquisition.

Said one Commissioner to an unsuccessful finalist: "Now, I want to go back to square one, about what you feel were the influences on your life. Although you say you grew up near Watts, your background is not what you would call economically impoverished?"

A. No. I would say I had a middle-class background. . . . By my third year in college I knew I wanted to some day run for elected office.

Q. Do you think a young Congressman can make an impact?

A. Yes, I believe there are many opportunities—meetings, groups, writing papers and. . .

Q. Are you a good writer?

A. Yes, I think I'm a good writer.

Q. What do you think about banking?

A. I enjoy banking. It has shown me the way minority communities can strengthen their economic positions. . . .But I consider my job more in the area of public affairs.

Q. So it's not banking that you like, but what it can do for minorities?

A. No, for *all* communities.

Q. Then you're not interested in banking and making money?

A. Not separately.

Q. You're pretty secure in your banking position, air-conditioned office and all.

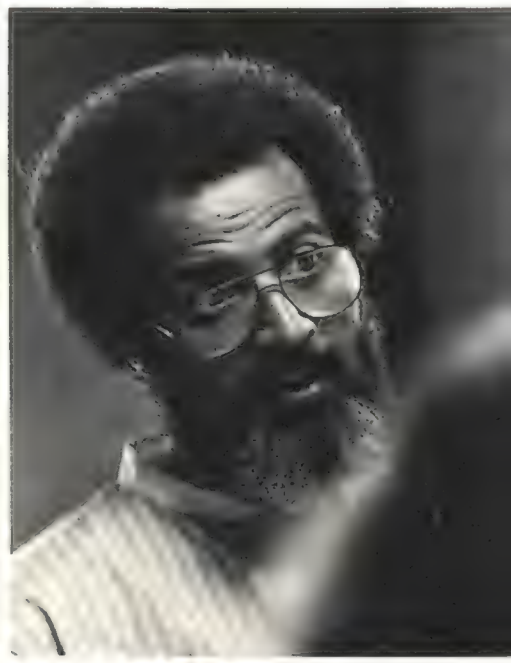
A. But I've had enough injustices in my life to know. . .

Q. What injustices?

A. At college a teacher who looked at me like "you're black, so you must be on the football team, so I'll take care of you" and didn't care whether I learned anything or not. . . .

Q. Do you have any serious weaknesses?

A. Yes, I think I do. I tend to overextend myself. Even though I'm overcommitted, I say "yes" and then sometimes can't do things as well as I should.



Photographed during their interviews, six aspirants weigh their words. From the left, they are Teresa Schwartz, Nelson Dong, Judith Sorum, Charles Martin, Francis Harvey and James

Q. Some of your recommendations came in with weaknesses but they all were different. Either the people didn't know you too well or they didn't think much about the question. But . . . can you see anybody seeing you as inflexible?

A. I don't think that's accurate.

Q. Have we gotten a real picture of the real you?

A. No, I don't think so. . . .I'm more than just a banker.

Q. We can see that. . . .Do you feel this selection process is good?

A. It's too difficult to learn about a person in just a few days. . . .

Q. We know that. In fact that's what our next Commission meeting is about. We know the system is a lot less than perfect.

Indeed, as Chairman Gardner reflected after the grueling weekend ended, "We often talk of other methods. We could simply interview one at a time and send them on their way—the disadvantage being that you'd never see them off guard. As it is, I think every Commissioner finds it extremely heavy, both physically and psychologically. The kind of young people who get through the regional finals are so full of self-affirmation. I never would have dreamed at 30," he mused, "that I myself could have won out in a White House selection."

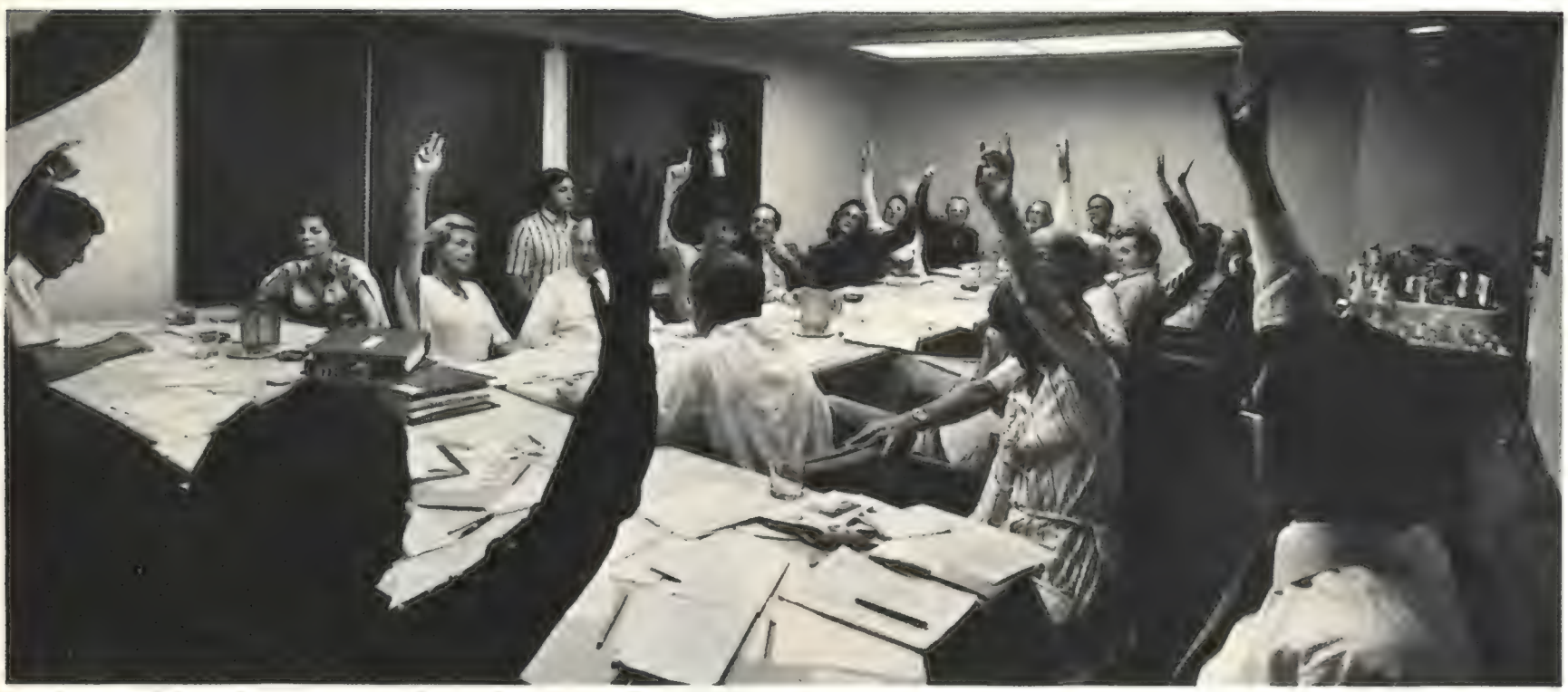
It is true that an almost palpable aura of confidence emanates from these young people who, as one Commissioner put it, "probably never lost a thing before in their lives." Just a few minutes after learning that she was not a winner, one finalist wiped her reddened eyes and assessed her position: "It's been worth doing but I wouldn't do it again. . . . I have set a five-year

Waiting his turn in a corridor outside an interview room, lone finalist briefs himself.

Padilla. All of these made the grade and will be at work in Washington by Labor Day.

plan for myself and this just won't fit in anymore."

Incessantly, between interviews, the interviewees interviewed each other. Was Lady Bird Johnson, paired in Room 144 with Steven Muller, president of Johns Hopkins, and attended by three Secret Service men sitting on hard chairs in the dim corridor outside, really as gentle as she seemed? Was Washington lawyer John Brebbia as hard-nosed as one heard? "Tom Johnson and John Gardner, they're nice," one candidate told another who had yet to face that pair. "Walsh and Scranton, now, they're pretty aggressive. They try to really test you." Said another: "I'm almost 31, and in my whole life I have never had such probing questions. Even *I* learned about myself in there." And another: "This is my first and last time because I



At their final session, Commissioners vote on a candidate with a show of hands.

At fateful hour the next morning, finalists are about to get their yes-or-no envelopes.

wouldn't subject myself to this again. Whether it turns out good or bad, I'll chalk it up as an experience." For him, it turned out bad.

They kept analyzing and reanalyzing the selection process, calling it challenging, interesting, rewarding but basically falling short of fun. "A large part of the final selection is too personal," said one finalist.

This year's finalists knew very well that they were in all-out competition against one another, but they kept it clean. In other years finalists have been known to spill drinks on a rival to embarrass him, or to shoulder in between a candidate and a Commissioner, interrupting their conversation. None of that this time; it was a reasonably philosophical group that held after-hours, bull-session parties, and even staged a self-conscious skit at Sunday lunch ("This is Dan Rather-not and the program is Ten Minutes") to kid themselves and their inquisitors.

By Sunday evening the round robin of interviewing was over. The Commissioners, most of them looking a bit worn, retired to deliberate in private. The candidates, keeping their cool, treated themselves to a final fling, still not knowing, like fraternity and sorority rushees, who was going to get a bid. They had arrived in a body, by chartered bus, and Monday morning they went back to Washington the same way, much better acquainted with each other while feeling giddy outside and subdued inside. Someone valiantly tried to carry on with such sing-alongs as *Old MacDonald.*

Coming up to the moment of truth

The appointed hour for finding out their fates was 10:30 A.M. in Room 1304 of the Civil Service Building. The tension, building gradually over six months and accelerating over their long weekend, was about to peak out. The moment came: there was a plain envelope for each one, bearing word of success or nonsuccess, and as they had been told, there were pay telephones out in the hall for passing the word along home. Some hesitated, massaging the envelopes as if their fingers could read the contents. Some ripped the flaps open on the spot, and some left the room to get their news in private. There was a good deal of hugging and kissing, sniffling and back-patting. A few of the losers faded away and did not return at all; others sought out Commissioners who had volunteered to be on hand for postmortem consultations on Why You Didn't Make It.

By the time the future Fellows gathered at the White House later that day for their official portrait, they were able (outstanding achievers that they were) to achieve fairly natural smiles. But they would not soon forget the weekend that had brought them their toughest time of testing. Neither would the losers.

Landis Jones and Olga Pierre (standing) of the staff pass envelopes to edgy candidates.

From pay phones, Carolyn Chin and Judith Sorum spread the good word they have just received.

For better or worse, the tension is over; two of the candidates show their relief with a bear hug.

The winners—1978-79 Fellows in jubilant mood on White House lawn

Michael Wheeler, 33, of Burke, Virginia, an Air Force major, is special assistant to the Chief of Staff in Washington, D.C.

Fernando Torres-Gil, 29, of Alhambra, California, is a gerontologist at the University of Southern California, Los Angeles.

James Padilla, 30, of Plymouth, Michigan, is in charge of fuel economy planning for the Ford Motor Company at Dearborn.

Nelson Dong, 29, of San Francisco, is an attorney, an expert on housing law and a Phi Beta Kappa from Stanford University.

Carolyn Chin, 30, of South Orange, New Jersey, is marketing manager with American Telephone and Telegraph in Morristown.

John Saxon, 27, of Birmingham, Alabama, is a trial attorney, a college teacher, author of legal publications.

Judith Sorum, 32, of Beltsville, Maryland, is assistant dean for academic programs at University of Maryland, College Park.

Isiah Leggett, 32, of Silver Spring, Maryland, is assistant dean of Howard University School of Law at Washington, D.C.

Charles Martin, 41, also of Silver Spring, is professor of education and the editor-in-chief of the *Journal of Negro Education* at Howard.

Steven Hill, 31, of Tacoma, Washington, is a forester and raw material allocation manager for the Weyerhaeuser Company.

Teresa Schwartz, 35, of Washington, D.C., a consumer activist, teaches at the George Washington University Law School.

David Calkins, 29, of Cambridge, Massachusetts, is senior resident in medicine at Beth Israel Hospital in Boston.

Francis Harvey, 34, of Murrysville, Pennsylvania, is an energy specialist, fellow engineer with Westinghouse in Pittsburgh.

Craig Ritchey, 34, of Palo Alto, California, is vice president and partner in a law firm there, a Stanford graduate.

James Scott, 35, of New York City, is vice president in the national banking division of Morgan Guaranty Trust.

The National Trust, London

Brown's lake at Petworth House, West Sussex, becomes navigable in this J. M. W. Turner painting.

By William and Rita Vandivert

He molded lakes and lawns for England's lords

'Capability' Brown, 18th-century landscaping genius, improved on nature and added still-visible splendor to many stately homes

A little more than 200 years ago in England, there was a surge of fashion in landscaping that permanently affected the look of the countryside. Visitors to the great country mansions that are now open to the public will often find in their brochures credit for the layout of the grounds given to a Mr. Brown. Indeed, in one of the grandest historic mansions his portrait shares brocaded wall space with Queen Elizabeth the First, her favorite, the Earl of Essex, and even Martin Luther and Oliver Cromwell.

Who was this phenomenal Mr. Brown? Lancelot (Capability) Brown was born in 1716 and died in 1783. The final 30 years of his life as a landscape designer and architect were spent working in such an explosion of effort that he redesigned and directed settings and buildings on about 200 English estates.

Called on to advise, he would spend a couple of hours to a day on horseback, riding over the land. He usually drew on the spot a plan of suggested changes,

Photograph shows Petworth House today, 226 years after Capability started work on the grounds.

which he presented most persuasively. His nickname, Capability, came from his habit of referring to his proposals for a property as its "capability."

You can see his work, mellowed by time, at many of the great English estates now open to the public. Petworth Park, in Sussex, for example, has been listed as one of the supreme works of 18th-century landscape gardening in Europe. The parkland which intrigued the painter J. M. W. Turner in the 19th century (opposite) still shows Brown's broad scheme. Descendants of the deer Turner painted crowd the grounds.

Here, in 1752, Capability began a series of contracts with Lord Egremont for extensive changes to the house's formal setting. In a crease of the downs you can still see the quarter-mile of lovely serpentine lake Brown created, with its tree-clad islands. He ripped out formal gardens and swept a great lawn down from the house to the lake's clean edge. In the vale below it he created a pleasure park with curving walks, trees and shrubs spaced skillfully. He protected the grounds about the house from deer and cattle with a ha-ha—a deep walled ditch with one sloping side to give anyone at the windows the impression of unbroken parkland. Beyond it he continued the landscape to carry the eye well over a mile through changing accents of woods, trees, grassy slopes and water.

Underlying this beauty was the hand of a practiced engineer. Throughout the park he ran extensive drains along marshy hollows to lead water to the new ponds and lake. He opened and controlled springs and built a dam to form the lake. To retain the water in the porous local subsoil, he faced the serpentine banks underwater with a cemented stone lining, still visible.

Petworth displays all the elements of Brown's style, which he termed "the natural look." His precepts led him to augment nature wherever he could; increase natural slopes, or create them as needed; build up and use water wherever possible; make drives and walks

Photographs by William Vandivert

curving or serpentine; group trees or shrubs to surprise; use encircling belts of forest to hide unwanted views, and so lead the eye from one pleasure to another.

He ruthlessly removed existing formal gardens, hedges and straight lines where they regimented the scene. He used as many established good trees as possible, and planted others with an eye to future maturity. His taste was for natural landscape sculptured in the round. He was master of such small touches as the view from milady's bedroom, but he thought big, too. To landscape a thousand acres just took more time, more men and more money.

His driving personality and his roughshod obliteration of earlier gardens brought cries of "Arrogance!" from detractors. But his talent and personality prevailed. His gift of persuasion is reflected in a letter written by Hannah More while she was staying at Hampton Court in 1782: "Never was such delicious weather! I passed two hours in the garden . . . with my friend Mr. Brown. . . . He illustrates everything he says about gardening by some literary or grammatical allusion. . . . 'Now *there*,' said he, pointing his finger, 'I make a comma, and there,' pointing to another spot, 'where a more decided turn is proper, I make a colon; at another part, where an interruption is desirable to break the view, a parenthesis; now a full stop, and then I begin another subject.' "

Successful genius always carries with it an element of luck. In class-ridden England, Brown had no advantages of birth. He was the son of a yeoman in the small village of Kirkharle, some 20 miles north of the river Tyne in Northumbria. However, he had a good education for his time and left school at 16.

By good fortune there was an opening as gardener

The authors' last contribution, in November 1974, described a restored London toy museum.

National Portrait Gallery, London

Brown's portrait by Nathaniel Dance hangs in Burghley House where he worked for some 30 years.

At Blenheim, Duke of Marlborough's seat, Capability dammed a small stream to improve scale of bridge, which the first Duchess had scathingly called "ridiculous." Winston Churchill was born here.

on the local estate of Sir William Loraine. During the seven years of his work there, he was in charge of at least one large landscape project involving considerable draining, clearing, contouring and planting. When he left in 1739, well qualified in horticulture, he set his sights on landscape designing in the south. He journeyed there with an introduction from Lady Loraine to her father in Buckinghamshire, who, as former High Sheriff, had wide friendships among prosperous landowners. Brown soon had an independent commission at nearby Kiddington Hall in Oxfordshire, followed early in 1741 by employment with Lord Cobham of Stowe as head gardener of his great estate.

It was the chance of a lifetime. This was no menial job: he supervised 40 men on the grounds, and was their paymaster, too. Stowe was in a state of growth and change. William Kent, the only landscape designer and architect of note in England at the time, was working closely with Lord Cobham, a rich man of great taste, on extensive alterations to the house and grounds. Brown undoubtedly drew much from association with both men and enjoyed their confidence. Not long after Brown's arrival at Stowe, the steward absconded with funds. His replacement did not live on the estate and Brown soon was acting clerk of works. This meant handling not only the grounds, but details of architectural work and payment of craftsmen.

There was great ferment in the countryside of 18th-century England. Rich landowners had to spend more time on their country estates to be on the spot for elections, rather than center their lives about their London houses. New turnpikes meant that friends could be invited to country seats. To improve these estates became first fashionable, then the rage.

The landed gentry were *very* rich—and powerful. They could enclose common land to enlarge an estate if they wished. They could change the course of a public road to improve the view. They could dam a stream

Warwick Castle's walls rise beyond lawn and trees that Capability planted in mid-18th century. When Horace Walpole came to visit in 1751, he noted that the view was "well laid out by one Brown. . . ."

or create a lake without local authorities protesting. They could demolish a village and rebuild it out of the way of an improvement scheme—as Brown was to do for a client at Milton Abbas in Dorset.

But a revolt in ideas was surfacing—a new humanism, a respect for natural qualities, a belief in the individual, a hatred of tyranny and regimentation, whether in politics or in design. Edmund Burke and William Hogarth were on the scene. And William Kent had already pioneered a revolt against the formality of Baroque gardens, essaying to coax nature to use her components of wood, water and earth in a new sort of natural landscape. At Stowe, Lord Cobham liked Kent's new ideas.

Brown came to Stowe in the final years of Kent's career. At Kiddington he had shown his own views on a natural look, which he subsequently polished to such effect that within ten years he was regarded as the sole landscape artist of merit in all England—with a whole countryside avid for his attention during the remaining 30 years of his career. To imitate his style became fashionable. By the end of the century, thousands of acres in the county of Sussex alone had been redone in the natural look.

At Stowe, Brown became a proficient architect. In supervising the execution of Kent's designs he taught himself architectural planning and rendering, for he saw clearly that landscape and architecture were to be closely combined in his future. The Grecian Valley at Stowe is the one work we may be sure was completely his own. To create a contoured, dogleg glade, Brown had 23,500 cubic yards of earth moved. Spade and wheelbarrow or cart were the tools. Plantings on sinuous curves edging the contours of the valley were backed by a containing wooded belt.

After Lord Cobham's death in 1749, Brown was prepared to establish an independent business. Commissions came comfortingly thick and fast. By 1750 he was at work on Warwick Castle. Situated almost at the center of England, on cliffs above the River Avon, its defending walls have stood since Saxon times. Brown tackled the stony slopes that dropped down to the valley, made lawns and set tree groupings under which today's tourists picnic (above). This done, he was invited to design more comfortable apartments within.

In the same year he started work at Croome, in Worcestershire. He began with extensive drainage of the site, a marshy tract between the rivers Avon and

Longleat, in Wiltshire, is secluded behind Brown's great trees and beyond his long lake, or "leat." Marquess of Bath opens grounds to paying visitors and keeps wild animals in a "safari park."

Severn. His work was to continue there for some 20 years, and Brown developed such a warm friendship with Lord Coventry that a memorial pedestal notes how Lancelot Brown "formed this garden scene out of a morass."

Burghley House, an enormous pile begun in 1552 by William Cecil, Lord Treasurer to Queen Elizabeth the First, was one of Brown's most important and longest assignments (p. 55). Starting in 1755, he worked on it for more than 25 years. While his proposals for drastic alterations of the house were under consideration, he began work on the grounds. As usual, he widened a marshy stream to form a lake behind a dam.

His accepted plans included ripping off two north wings of the house to open up a magnificent view across the park, raising the south facade by several feet, changing the windows and lifting and regrading the lawn down to the river. Where the view had been opened up he circled new lawns with an extensive ha-ha. Inside it he grouped supporting trees to enhance a great linden planted to commemorate a visit by Queen Elizabeth the First.

To the east of the house Brown added a stable block with Gothic crenellations and an elegant greenhouse, now called the Chinese Orange Court, which has been converted by the present Lord Burghley into a restaurant for today's paying visitors. Brown continued planting the parklands and built a handsome stone bridge to cross the lake at the western end. Four lions couchant adorn the two ends of the bridge.

Another of Brown's important works was undertaken for the first Marquess of Bath at Longleat in Wiltshire in 1757 (above). Although lions, tigers, giraffes and elephants now wander through the safari park behind the house, Brown's imaginative treatment still dominates the valley.

Capability removed the stiffly formal lines of the gardens about the 16th-century Renaissance house, reworked the straight lines of trees and water. He created a chain of lakes with graceful curves, rearranged trees in carefully set groupings, using oak, chestnut and beech to show nature at its best. And over the 200 years since the basic design, it has been kept unspoiled. You can drive your car and spread your picnic beneath the same beeches Capability planted to contain the view from the house.

The present Lord Bath is carefully replanting where aged trees fall. He warms as he speaks of Capability:

"Brown had great imagination and understanding. It takes 70 years for an oak or beech to come to size. He had to *know* what they would do." Then he sighs, "But I would have liked more garden and flowers by the house."

Brown the businessman was always able to take care of Brown the artist. This he showed in 1760 when he was called in to improve the Wiltshire estate of Corsham Court and enlarge the house. He was required to provide a gallery to house the famed Methuen art collection. To make the ceiling he used a design of his own which had been rejected by an earlier client. The adaptation resulted in one of the finest ceilings in all England.

A bumper year was 1764—when the good offices of influential well-wishers, including at least two dukes and a dozen other noblemen, finally brought him an official post in the Royal Gardens. By midyear he was installed as Master Gardener at Hampton Court and Richmond, with the advantage of a residence at Hampton. Here the most notable thing he did was to plant the Great Vine, which still bears a bountiful crop of grapes each year. Old Park (now a part of Kew Gardens) at Richmond demanded more of Brown's time in alterations and improvements. This was George III's favorite retreat and he followed each stage of the work. When the king was in residence, Brown was expected to be frequently on hand to discuss details and he established an easy relationship with the king.

This was also the year he was at work on the Duke of Marlborough's palace at Blenheim, near Oxford. The work continued over the next ten years with fees totaling more than £21,500. It is a masterpiece, considered by some to be his finest.

Away went the formal gardens to be replaced by the natural look. But the greatest change was brought about by damming the little local river, the Glyme. For some reason Sir John Vanbrugh, the original architect, had thrown a disproportionately tall bridge across the deep valley west of the palace. Sarah, first Duchess of Marlborough, disliked it intensely and scathingly referred to it as "that ridiculous bridge." But Brown raised the water high enough to replace the slim stream with two connecting lakes over half a mile in length. This brought Vanbrugh's bridge pleasingly to size. The angled lakes come to a clean edge planted with great trees to form a magnificent setting for the palace (pp. 50-51).

Capability maintained friendships with the great, among them the Duke of Northumberland and William Pitt, Earl of Chatham. Brown was opposed to the war with the American Colonies—characterizing it as an "unfortunate and disgracefull a war." He was able, through easy access to George III, to attempt in 1777 a reconciliation of the King and his former moderate Prime Minister, Pitt—out of office and in disfavor. With Pitt's sudden death nothing came of this.

Feelers for work abroad never tempted Brown. To one Irish nobleman who offered him £1,000 on landing if only he would go to Ireland, he answered that he had not yet finished England.

Now that many of his works are endangered or fading from the scene, Capability is once again being given some of the acclaim due him as a great 18th-century artist. The gradual eclipse of his reputation over the years was inevitable. As an obituary said: "when he was the happiest man he will be least remembered; so closely did he copy nature that his works will be mistaken."

It is fortunate that he preferred beech, oak, chestnut or linden, as well as Oriental cedars and other exotic conifers, to elms, now so devastated by disease. But each year age topples trees he planted. Victorian taste and 20th-century preoccupation with planting overlays many an original Brown design. To recognize his actual contribution nowadays calls for a kind of garden archaeology.

Death duties have for decades taken a crippling bite out of the great estates, but the transfer tax of 1975 has far wider powers—it collects on any gift or transfer, however made. The tax doubles if the transfer occurs fewer than three years before death.

It is for these reasons that many of today's British noblemen throw open their houses and grounds to the flood of paying tourists. This allows treasures that have so long been hidden in private estates to be seen at last and appreciated by all.

Burghley House displays Brown's touch in landscape and has carefully retained his face-lifting plans.

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By Vine Deloria jr.

Largest collection of Indian items is put on display

'Echoes of the Drums,' important exhibit of material from the huge Museum of the American Indian, opens this month

There is a natural antipathy between American Indians and museums which specialize in Indian collections. Museums sometimes seem to testify to the dominance of one culture over another. That is to say, museum exhibits are all too often composed of the everyday household goods of smaller societies—which are expected by more powerful societies to vanish.

In the United States, scholars have collected American Indian artifacts by purchasing family heirlooms from impoverished natives and also by regularly invading Indian cemeteries to carry off personal possessions left by grieving relatives decades or centuries before. The traditional justification for this is that the scholars are *preserving* the objects for the benefit of the vanishing culture.

But even the hostile evaluator must admit the significance of the world's largest single collection of Western Hemisphere aboriginal art and artifacts—from which a representative selection will go on display, beginning this month, in New York.

This collection, the Museum of the American Indian, Heye Foundation, resides in a relatively unknown cultural complex called Audubon Terrace at Broadway and 155th Street in New York City and at its research branch in the Bronx. The collection is so large (some four million objects) that no more than ten percent of it can be displayed in the museum's present galleries. Soon after it opened in 1922, it outgrew a single location. Annexes then housed the artifacts and books, and it became merely a collection in storage.

On the 15th of this month, "Echoes of the Drums," the most comprehensive special exhibit ever mounted by the Museum of the American Indian, will open at the old U.S. Custom House in lower Manhattan. Sponsors of the exhibit will be the museum itself, the Custom House Institute, the New York Landmarks Conservancy and the General Services Administration. Between 500 and 1,000 items—90 percent of which have never before been on view—will be included. The exhibit closes on October 31. It then passes from view until it finds a permanent "display case" at least comparable to the Custom House in size and convenience of location.

How the collection came into being is a story in itself. Gustave Heye (pronounced "High"), father of George, once owned an oil refinery coveted by John D. Rockefeller. Rather than trying to lick Standard Oil, the elder Heye decided to join it, and so got a large block of stock for his refinery and a lifetime position with the giant corporation.

By the time his son had graduated from college as an electrical engineer, the family fortune was large enough to allow self-indulgence on a magnificent scale. Unlike William Randolph Hearst, who collected everything, George Heye for 61 years focused on Indians. Before he died he amassed millions of items, and in the process set so many precedents in museum-keeping and collecting that almost every virtue and sin of the museum world could be laid at his doorstep.

Heye started collecting innocently enough by acquiring a simple buckskin shirt from the wife of a Navajo railroad worker while on an Arizona engineering job in 1896. Occasional acquisitions followed, but nothing indicating a propensity to hoard.

In 1903, Heye was given a large group of prehistoric pots from New Mexico. This seems to have sparked a hidden fire in his soul, for he began to accumulate all kinds of things Indian and soon had to rent space.

Once, learning of the presence of a Munsee-Delaware cemetery in New Jersey, Heye hired a crew and began digging. He found himself hauled before a local court and charged with grave-robbing. He was fined $100 and each member of his crew $10. Livid at this disruption of his hobby, Heye appealed the case. The New Jersey Supreme Court recognized a gentleman's activity when it saw one and reversed the conviction. And with this incident behind him, Heye went hemi-

Three-foot-tall kachina figure, carved by Marshall Lomokema, stands outside New York's Custom House, where Indian exhibit occupies much of the first floor. Kachinas are Hopi spirits who live amid the San Francisco Peaks of northern Arizona.

Color photographs by Yale Joel

Items on display include (from left) a kachina from the Hopi village of Oraibi, Arizona, carved by Willard Sakiestewa c. 1958, a feather bonnet from Montana, three splint baskets from Chitimacha, Louisiana, and quilled moccasins from the Great Lakes—made in 1790s.

Tall drum at left is from Zuñi Pueblo, New Mexico. Standing, end-on, is an Arapaho drum, and below it two small drums, one from the Koasati tribe

George Heye, avid collector and museum founder, died in 1957. Hidatsa Indians named him Slim-Shin.

spheric, gathering everything he could buy or excavate from the Arctic to Tierra del Fuego.

By 1915 Heye badly needed a building. When Archer Milton Huntington offered some land for a museum, Heye eagerly accepted and established the Museum of the American Indian at Audubon Terrace, where today other organizations such as the American Academy and Institute of Arts and Letters and the Hispanic Society of America are also located. The next year he set up a foundation to endow the museum. He labeled himself director, with sole powers to name a board of trustees. World War I delayed the opening until 1922, when it then became available to the public, but with severely restricted hours. The museum was, beneath all the corporate boilerplate, Heye's semiprivate establishment.

The final scoreboard of Heye's collecting frenzy is impressive. He amassed the world's finest collections of Iroquois and Algonquian artifacts, as well as outstanding collections of Comanche, Mexican, Brazilian, Zuñi, Hopi, Navajo and Blackfoot objects. He also acquired the finest Mexican turquoise mosaic shield in the world and the wampum belts William Penn received from the Lenapes to confirm purchase of eastern Pennsylvania. He hoarded 80 decorated buffalo-hide robes, 250 pairs of snowshoes, the artifacts from Love Lock Cave in Nevada, a magnificent array of Plains Indian materials gathered in the 1850s at Fort Laramie, the rifles of Chief Joseph (see SMITHSONIAN, May 1978) and Geronimo, as well as of lesser-

of Upper Creek, Louisiana, the other a pottery drum from Catawba country, North Carolina. Buffalo drum, at right, is from the Mandans.

Buff-ware jar at left was made by Rachel Nampayo, an Arizona Hopi. Ladle is from horns of mountain sheep and goat with a copper-shell handle from the Haida of British Columbia. Effigy is from El Salvador, and wooden fiddle from White Mountain Apaches, Arizona.

known leaders, and the Josiah Cotton copy of the second edition (1685) of John Eliot's Indian Bible, which is written in the Algonquian language.

The North American collections are highly significant in art, costume, ceramics, basketry, beadwork, textiles and tools. Eastern and Southwestern materials, the latter especially strong in its ceremonial and technological aspects, are exceptional. Pacific Northwest art has major importance. Latin American materials feature fine metal and feather ornaments from Peru; unrivaled ceramics, jewelry and stone carvings from Panama; extremely valuable ceramic materials from Costa Rica; superlative Mayan textiles, masks, ceramics and stone sculptures from Mexico. Additionally, Caribbean and Ecuadorian collections are rich in archaeological materials and rare sculptures.

The museum also contains the Foundation library with about 40,000 volumes on deposit in the Huntington Free Library and Reading Room in the Bronx, and photographic archives with more than 70,000 negatives and prints combined—a great number of them early and authentic unposed pictures of Indian life.

The museum's chief problem has been publicizing the scope and richness of its material. There is simply too much to display. In 1973, the Metropolitan Museum of Art made a major effort to inform New Yorkers, if not all Americans, of the treasures stored by the Heye Foundation. But its exhibition, entitled "Masterworks from the Museum of the American Indian," contained only 200 items.

So a new board of trustees, appointed in 1976 and 1977, had a formidable task before it when it was decided to mount a major exhibition. The new director, Dr. Roland W. Force, happily accepted the suggestion of the Smithsonian's senior ethnologist, John C. Ewers, that the exhibit be grouped according to categories rather than tribe or cultural area.

Thus the Custom House show will feature artifacts arranged according to their function: music, masks, costume, ornaments, containers, and games. By crossing tribal lines, the exhibit will demonstrate the great similarity of tribal adaptations to environment, as well as express the innate spirituality which Indians manifested in their daily activities.

"Echoes of the Drums" includes library materials, tape recordings of songs and events, and many photographs illustrating the life-style and experiences of different tribes. This means that the artifacts, tangible expressions of the past, spring right to life when combined with audio and visual dimensions.

Mounting this exhibition is simply one of the many new projects being planned. Noted anthropological scholars like Frank Gouldsmith Speck, Samuel K. Lothrop, Thomas Talbot Waterman, Alanson Buck Skinner, Melvin R. Gilmore and Mark Raymond Harrington spent part of their formative years working

Political science professor Deloria, a Standing Rock Sioux and Museum of the American Indian trustee, is author of Custer Died for Your Sins *and* God Is Red.

This Osage wedding costume from Oklahoma was worn by Mary Redeagle in marriage to Paul Beartrack.

An Osage buffalo-hide drum from Oklahoma forms background for a photograph of the diorama of a Plains Indian campsite that can be viewed at the exhibit. The display continues through October.

with the Heye collection. Even the venerated Frederick Webb Hodge, editor of the first edition of the Smithsonian's *Handbook of the Indians North of Mexico,* worked with George Heye on some of the items. Today, Indian scholars are fast moving into the social science fields that were once exclusively the domain of the non-Indian. The museum foresees a time, not too distant, when the libraries and photographic archives will be the major interest of Indian scholars. Several Indians of national prominence, including archaeologist and educator George H. J. Abrams, Pulitzer Prize-winning author N. Scott Momaday, and John Hunt, associate director of the Institute of Advanced Study, in Princeton, New Jersey, are already on the board of trustees.

Even before it became incorporated officially, the museum was a prime motivating force in excavating Indian sites. From 1906 to 1908, Heye and his mother supported expeditions to Ecuador that uncovered many things now held by the museum. These include

This square medicine drum belonged to a Hunkpapa Sioux leader named Tatanka Yotanka, or Sitting Bull (*not* the one who beat Custer). The backdrop is a handwoven Navajo wool blanket from Arizona.

a group of musical instruments of undetermined age.

The trustees are considering an expanded program of sharing items with emerging Indian tribal museums. Already they have loaned a number of important items to tribal cultural centers for special displays, and plans are under way to assist tribal people to create their own multimedia presentations.

Contemporary Indians have a crying need for "more information"—on obscure customs and traditions, on half-forgotten historical incidents, on natural technologies developed by various tribes to enable them to live comfortably in hostile environments. Rather than become a purveyor of general information, the museum has decided to develop information services.

Archer Huntington established a publications program in 1919. Over the next two years, 61 books and pamphlets were published—a total of 5,529 pages of findings both on Indian history and specific archaeological excavations. The new board is eager to develop a much more comprehensive publications program.

Seminole councilor's coat and turban is of cotton patchwork. Plume is of white egret feathers.

"Echoes of the Drums"

Two months ago, the museum issued a strong policy statement regarding the ethics of collecting and lending which may serve as a model. Among its provisions are that the museum would exchange material only with other museums, not with individuals or dealers, and that it would not consider acquisitions that had been removed improperly from their country of origin.

In 1934, the Hidatsa Indians of North Dakota learned that their sacred Waterbuster bundle, acquired many years before by a missionary in behalf of Heye, was held by the museum. The bundle was considered vital to the traditional rain-making ceremonies of this tribe of the Northern Plains, an area then still gripped by the severe drought which plagued the mid-continent during the 1930s and created the Dust Bowl.

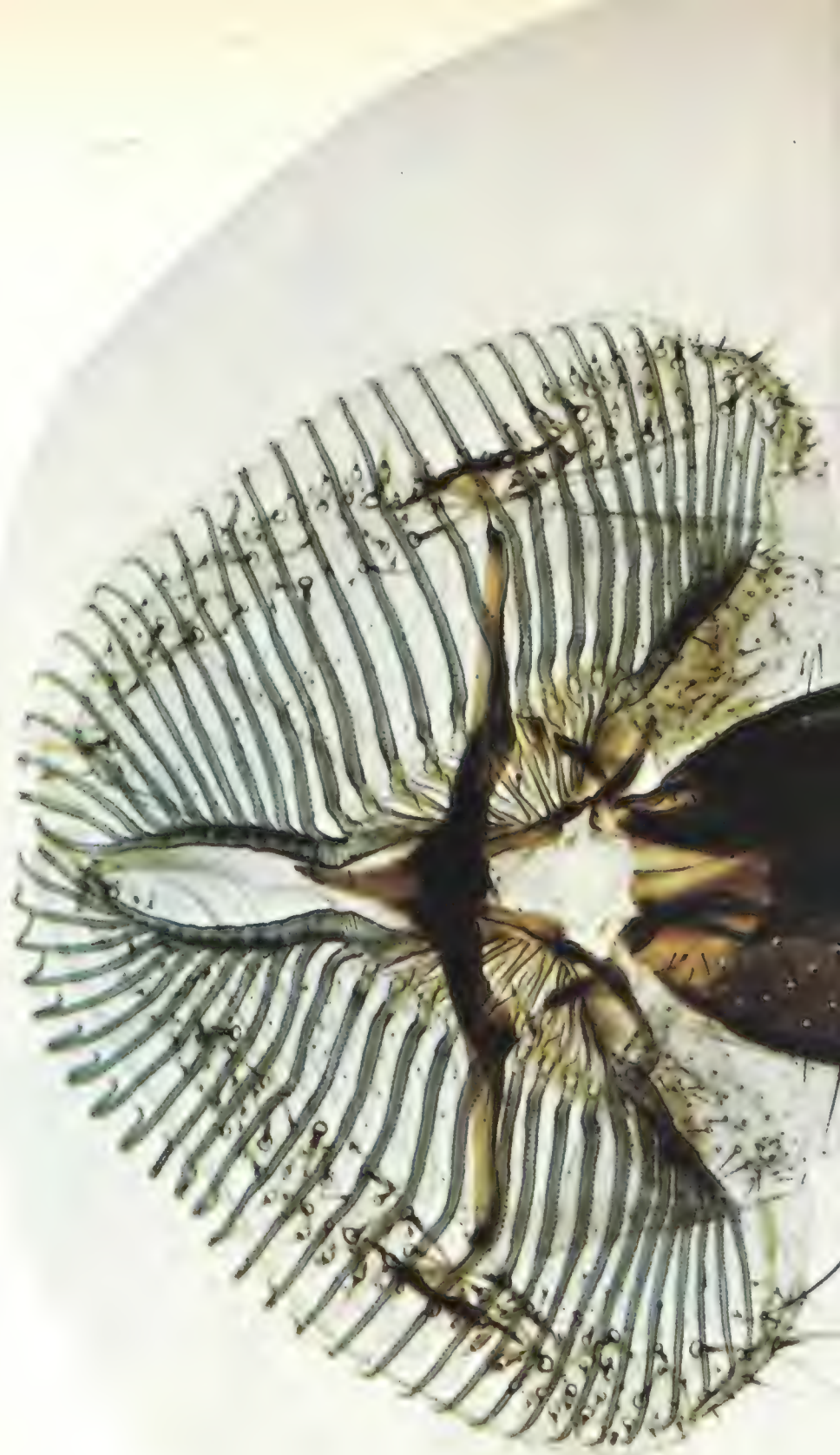
Over the next three years, tribal leaders petitioned Heye for the return of the bundle, but he was adamant in his refusals. In 1938, two elderly religious dignitaries, Drags Wolf, aged 75, and Foolish Bear, aged 84, showed up in New York. In a negotiated exchange, consummated by a formal ceremony, the rotundly built Heye received the Indian name Slim-Shin—and a sacred buffalo medicine horn in lieu of the Waterbuster. The next summer, rain fell on North Dakota.

A wealth of Indian masks lies on a Navajo rug. Top row: Cayuga pig mask from Ontario; maternity mask of New York Senecas; Cherokee deer mask, North Carolina; Kwakiutl mask, Vancouver Island. Second row: Eskimo spirit mask; Mexican Mayo mask; Tlingit copper mask, Alaska; Seneca doctor mask. Third row: Seneca beggar; Cherokee buffalo; Nishka (British Columbia) old woman, mountain hawk. Bottom row: Tlingit; jaguar-ocelot, Mexico; two more masks from British Columbia.

By Hal Bowser

Invisible world sings a siren call to amateurs

As an all-consuming hobby, microscopy can afford the nonprofessional a chance to contribute to real science



The business end of blowfly's proboscis (left) reveals fanlike array of labellum lobes. Digestive juices

The most exciting gift I've ever received was the microscope my parents gave me for Christmas when I was 11.

It was a tiny 'scope, hardly more than a toy, and the image you saw through its eyepiece was a bit skewed and smudgy. But no matter: that toy promptly stood my little world on its head, opening up for me a whole new realm of color, action and ideas.

That Christmas day, the first thing I looked at under the new microscope was a drop of water dipped up from a brackish rain puddle in our backyard in Brooklyn. I'd heard that long-standing puddles with a bit of rotting vegetation in them were apt to be full of strange and wonderful living things, and I certainly wasn't disappointed: as the droplet sprang into focus, I saw all kinds of odd-looking creatures tumbling and cavorting about in the bright, circular field of view.

One of these creatures was a large, comparatively slow-moving fellow. It looked, I remember thinking, like a dirigible or a shrunken dinosaur (at 11, I was very big on dirigibles and dinosaurs). What puzzled me intensely was that this creature had at one end of its body what looked like two slowly turning wheels.

Then I saw another arresting sight—a long, slipper-shaped animalcule that was darting and veering among the other creatures like a police launch cutting through crowded harbor traffic. This creature intrigued me even more than the one with "wheels" because, while I could plainly make out all its organs churning away inside it, I couldn't figure out just what it was doing to make itself zoom along so fast.

Later, I was to learn that the dirigible-shaped animal is a rotifer—the name is from the Latin for "wheel-bearer"—and that its "wheels" are actually rounded appendages covered with hairs called cilia. By lashing these cilia about, one after another, the rotifer creates

flow through opening between lobes onto carrion;
meat is partially digested and sucked up by the insect.

currents that sweep even tinier creatures and bits of vegetation into its mouth. The sequential motion of the cilia deceives the microscopist's eye into thinking the wheels are turning, somewhat the way the lights blinking on and off on a movie marquee seem to be

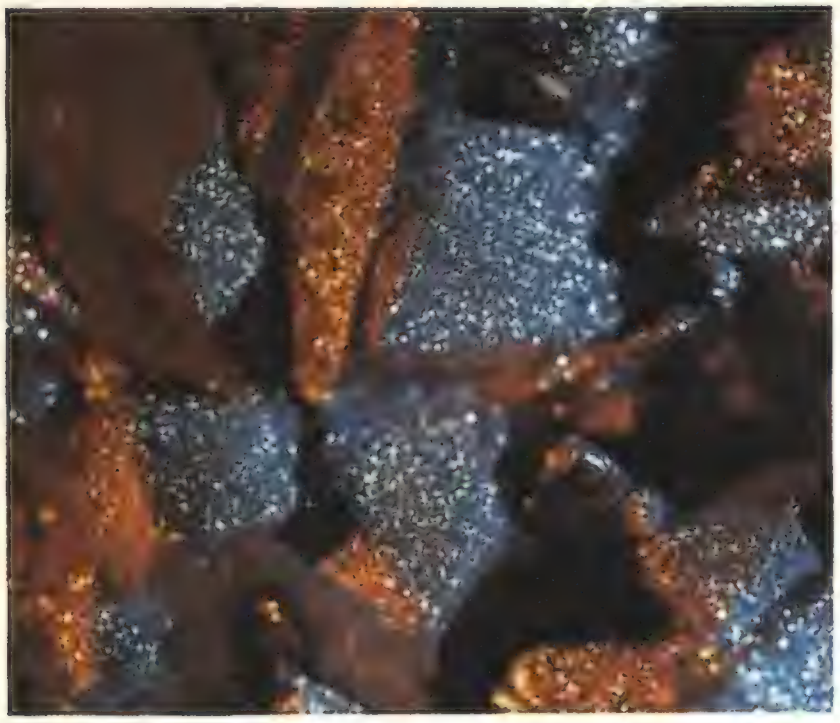
E. P. Herlihy, legendary eighty-year-old member of Britain's Quekett Club, prepared the slide at left.

racing around in circles. I also learned that the slipper-shaped creature is a paramecium, a creature so brash, active and omnipresent that I think of it as the Volkswagen of the microworld. Paramecia can move so fast, I found, because they, too, are covered with cilia (not visible under that first microscope of mine) which beat the water like oars, or whips, and propel the creatures along smartly.

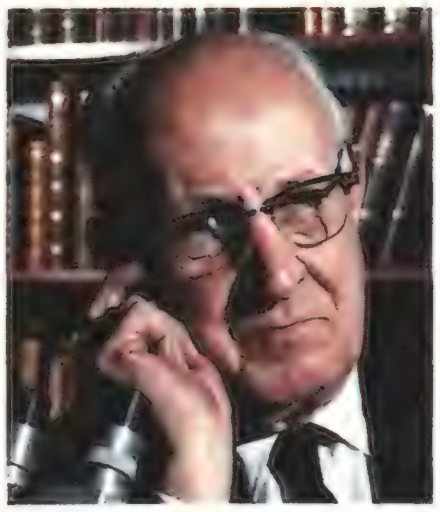
But, on that winter day, the facts about what I was looking at mattered not at all: I was too caught up in staring, agog, at the riot of movement in that droplet of water. At the same time, on a not very conscious level, I was already beginning to take in what I now see as one of the great lessons microscopy can teach you—which is that under the piercing eye of the lens nothing, not even slimy ditchwater, is contemptible.

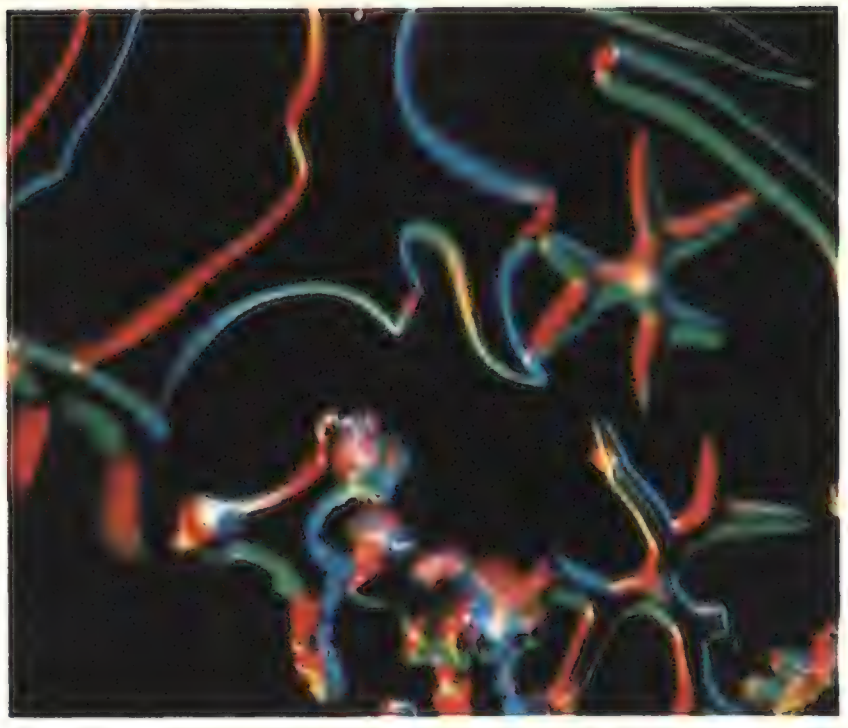
It took me, of course, many years of devout gazing through the eyepiece at all sorts of things to bring that lesson fully home to me. During those years, like a shark in feeding frenzy, I kept thrusting under the cyclopean eye of my little 'scope anything and everything that came to hand: stamps, coins, snowflakes, houseflies, flower pollen, spiders, onion skin—even rather dim, ghostly-looking cells scraped from the wet inside lining of my cheek.

Photographs by Phillip A. Harrington

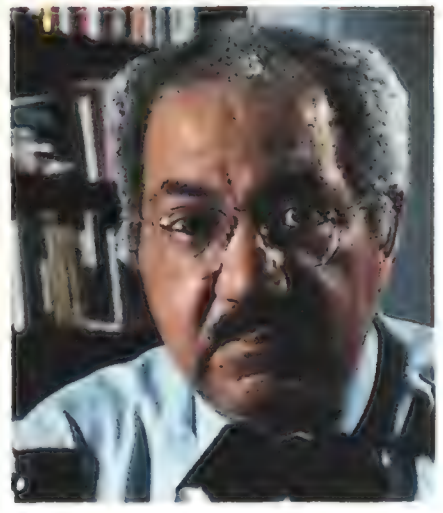


A sample of calcite (familiar to us in the form of chalk or marble), glows blue and bronze under low magnification. The "sequins" are an incrustation of another mineral, marcasite or pyrite. The slide was made by Winston Clay, right, who specializes in mineral studies.





Spicules (the skeletal elements) of sponges form an abstract design under the microscope. This specimen is from Czechoslovakia. The slide is from the collection of the author, right, who also collects old and new microscopes. He is a senior editor with *Saturday Review.*



Few things are less attractive than horse urine—something which in my youth was a common sight (and smell) in the streets of Brooklyn. Yet when horse urine is evaporated until it forms crystals of hippuric acid, and is then looked at through a microscope fitted out with inexpensive polarizing filters, it blazes forth in wildly beautiful forms, and even wilder colors, that are remindful of psychedelic paintings.

So when I say that the microscope transformed my view of the animal, vegetable and mineral world around me, I mean just that: it dawned on me young that microscopy means never again having to be bored.

A second phase of my life in microscopy began about 15 years ago, when I joined the New York Microscopical Society (NYMS) and began for the first time to meet large numbers of real live "micromaniacs."

The 100-year-old Society, which alternately meets at the American Museum of Natural History and the New York Academy of Sciences, has about 300 amateur and professional members. Before and after the twice-monthly evening lectures I found myself talking mostly to the amateurs (though the professionals were certainly friendly enough, I was a bit awed by them). These amateurs were a strangely mixed bag, ranging from happy dabblers like myself right on up to people who were doing—purely for the love of it—spare-time microscopical research on a high level.

Overnight, I found myself meeting protozoologists, mineralogists, crystallography buffs, collectors of microscopes and diatom specialists—all of them amateurs and all of them bursting with the need to talk about their specialties.

All this was a dizzying experience for me: after several solitary decades at the microscope, here I was surrounded by like-minded amateurs. It was as if I had run into several dozen clones of myself who had already done most of the things in microscopy I'd always fantasized about, had I but space enough and time.

I'd often wished, for instance, that I could learn more about those heroic old turn-of-the-century, all-brass microscopes of the sort one imagines Sherlock Holmes peering into. Then I met an amateur, since deceased, who knew all there was to know about old 'scopes and whose collection included hundreds.

Looking more like a sand dollar than anything else, this is a diatom—a unicellular plant. This particular diatom was collected in the Soviet Union. At right is Joseph F. Burke of New York, a retired banker and a world-renowned specialist in diatoms.

These mirror images are the two parts of a single-cell alga, a desmid, with the nucleus in the middle. It was collected by Thomas E. Adams, right, who keeps track of some 700 species of life, mostly microscopic, in a six-acre pond in Pennington, New Jersey.

I had also long wished I knew enough about cameras to take good, sharp photographs of my favorite specimen slides: here, talking about the latest wrinkles in technique, were schools superintendent Mortimer Abramowitz and businessman Philip Feinberg—amateurs whose exquisitely detailed photomicrographs are exhibited right alongside those of top professionals.

Another example: I'd often thought what fun it would be to piece together a really comprehensive collection of slides prepared by the great old-time slide makers—Thüm, Möller, Enoch and others—and to learn something about the lives of these remarkable craftsmen. Suddenly, here I was talking with John Prineas, a former Australian who works all day as a clinical neurologist doing multiple sclerosis research with electron microscopes, but whose avocation is collecting information on the great slide preparers and examples of their work. Many of the slides in his collection are still perfectly usable, though they date from the late 1700s!

If my years as a solitary eclectic had left me with some small idea of the beauty and complexity within the microworld, I was now to learn that I didn't know the half of it. I met a lean, bearded, 36-year-old English teacher named Tom Adams (above) who shares my excitement over protozoa. But Adams has taken things a step further: for the last two years he has been running an intensive check on conditions among the life forms (most of them microscopic) that inhabit a six-acre pond ten miles from his house in Lawrenceville, New Jersey. Amiable Tom Adams has the biggest protozoan-culturing aquarium any amateur could want!

"So far," he told us one night over coffee after one of the NYMS lecture meetings, "I've charted the seasonal fluctuations among more than 700 different forms of pond life. When the pond freezes over, I walk onto it and use my pick to chop through as much as 18 inches of ice, such as we had in the East last winter, so I can get at the protozoa underneath."

Listening to him, month after month, the group has come to share the excitement of Adams' year-round hunt. Recently I asked him how the census is coming along. "It'll be finished by October," he said. "Then I'll turn my findings over to the Environmental Pro-

New York microscopists often gather for coffee near American Museum of Natural History. John Prineas,

tection Agency, or one of the other groups interested in seeing serious amateurs do studies of protozoa and their role in the ecological chain."

Then there is Joseph Burke (p. 69), 81-year-old past-president of the Society. He works alone from morning till night in his top-floor office at the Staten Island Museum studying an algalike species of plant called the diatom. The shining, glassy, graceful skeletons of diatoms have fascinated dedicated amateurs for many generations now, and Burke is in the classic mold.

Back in the 1920s, when he was with a prominent New York banking house, he began boning up on diatoms in his spare time. Eventually, he learned so much about them that he actually began to challenge the classification system set up by such earlier diatomists as Belgium's renowned Dr. Henri Van Heurck.

Now retired and a world figure even among professional diatomists, amateur Burke works tirelessly on his thesis that given diatom species are not exactly the same the world over, but vary minutely from place to place. This research is just the sort of painstaking inquiry that seems pointless to most of us, but then suddenly turns out one day to have enormous practical implications—as when the oil companies found to their delight that some types of diatoms are highly useful as indicators of possible oil-bearing rock formations.

Soon after joining the Society I signed up for one of its annual exhibits. A long hall was filled with microscopes set up to display members' pet projects.

There were gigantic, glistening, all-brass Victorian 'scopes, bristling with knurled adjustment wheels and looking like art objects. Then there were the formidable black-and-chrome present-day research microscopes, complete with an awesome array of accessory gadgets. For a budding equipment nut, that exhibition was heaven on earth.

My own display was a modest one: I simply exhibited—through an excellent binocular 'scope I had bought second hand—a slide showing (what else?) hippuric acid under polarized light. My "wrinkle" was that I had paid an optical repairman to replace my microscope's regular eyepiece with bulky telescope eyepieces—the result being an enormously wide-field "porthole" image that displayed the multihued crystals to stunning effect.

Near my table was Winston Clay (p. 68), a retired businessman, showing tiny rock samples through his magnificent three-dimensional stereoscope, which is in effect two low-power microscopes mounted side by side and "toed in" so that each of the viewer's eyes sees the specimen from a slightly different angle. The result is something like looking at an undersea landscape of corals and other plant and animal life beneath the surface of the water.

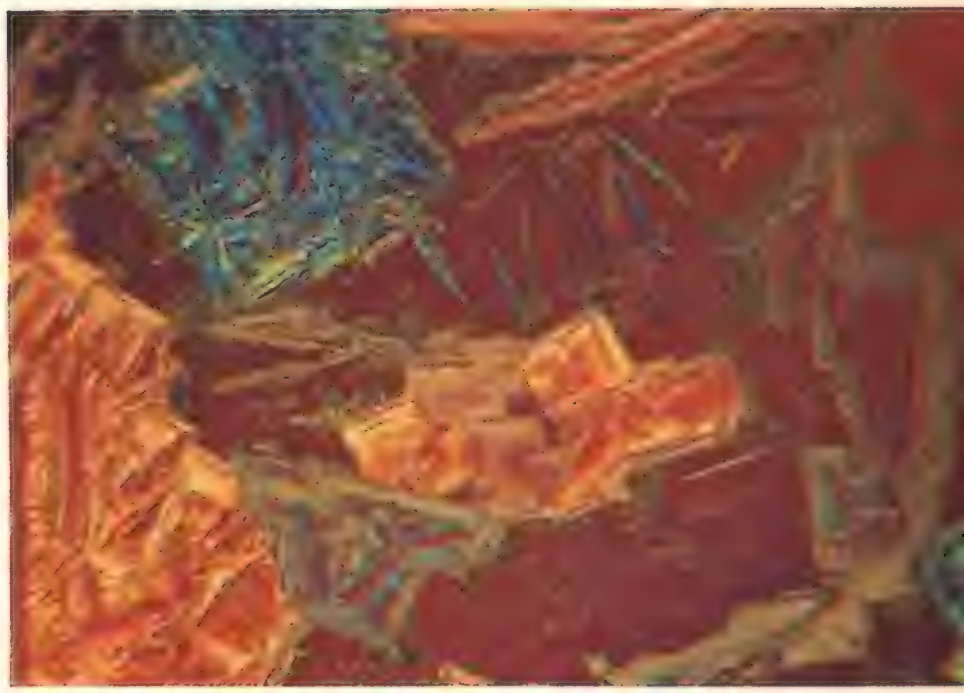
And so it went from exhibit to exhibit: blood cells pouring through a frog's webbed foot; a horrific-looking cheese mite bristling with hairy, spiky legs; a hundred diatom skeletons carefully arranged by an old-time slide preparer in a rose-window pattern; and a late 19th-century photograph shrunk down optically by a Victorian-era slide maker till it was clearly visible

left, shows off antique 'scope to Charles Gellis (at eyepiece), Marc Arlen, Margaret and George Uibel.

only under a 100-power 'scope (this technique foreshadowed the microdot later used by spies).

When I burbled about the instruments and accessories to the Society's coffee-klatch gang (who'd all been there exhibiting), they nodded dourly. "Look, you don't want to get equipment-happy," one of them warned me. All of them nodded agreement, and of course they were right. In fact, if you are willing to settle for modest magnification, say 50 or 100 power—which is plenty for the early stages of microscopy, or even for a lifetime of viewing—you can buy from one of America's top optical "names" an excellent little beginner's 'scope that costs less than $30. Add to that a $10 kit containing the paraphernalia for preparing your own slides, and you're off and winging.

In the years that followed the exhibition, I learned that there are other active microscopical societies in Philadelphia, Chicago, Los Angeles and San Francisco. Abroad, England and Germany are the big amateur strongholds. The biggest British group is the Dickensian-sounding Quekett Microscopical Club (the famed Royal Microscopical Society is now almost entirely professional). On the Continent there are active amateur societies in Stuttgart, Hamburg, Mannheim, Mu-



A portfolio of amateur photomicrographs: sodium nitrite, the controversial food preservative, at top; in the center are dyed grains of hollyhock pollen; and urea crystals, bottom, commonly found in fertilizer.

nich, Zurich and Vienna—all sharing the facilities of the German-language journal *Mikrokosmos*.

Occasionally, someone from these overseas groups causes a stir by visiting the NYMS. E. P. Herlihy, of the Quekett Club (p. 67), came over a decade ago and gave a charming, memorable account of his long, happy life at the microscope—he was then in his seventies. Several members, myself among them, still correspond with him occasionally, and every issue of the Quekett Club newsletter brings details of some ingenious demonstration Mr. Herlihy has given before the club in his special fields of interest, insect studies and polarizing and ultraviolet light effects. And in the NYMS newsletter, which I edit, member Eric V. Gravé provides lively summary translations of articles appearing in *Mikrokosmos*.

In all this talk of organized amateur activity, I don't mean to slight the "unorganized" amateurs—it's just that it isn't easy to pin down details of their numbers and their interests. Many of them prefer to work alone, and others don't even know there *are* amateur societies. Every once in a while, though, one of these separated brethren explodes into view as when, in the early decades of this century, a hermitlike Vermont farmer and amateur microscopist named Wilson Alwyn Bentley (see SMITHSONIAN, January 1976) astonished scientists by doing invaluable pioneering, professional-level research on snowflakes. Bentley's beautiful snowflake atlas is still a standard work.

Nowadays, Alexander Marshack, a onetime journalist and amateur, is causing a small revolution in paleontology by turning his stereomicroscopes on the dimly visible patterned scratches covering many prehistoric bones—reindeer teeth, woolly mammoth tusks and other bony remains—that have hitherto gathered dust in the world's museums. Paleontologists used to think these markings were mere decorative patterns idly gouged and chipped out of the bones by dimwitted cavemen.

But studying these bones—originally with a $15 Japanese stereomicroscope—Marshack has, over the past decade or so, developed the startling thesis that these 30,000-year-old "scratches" were part of a complex symbol system consisting of some dozen separate notations that may be the early beginnings of the calendar, arithmetic, writing and geometry as we know them. If he is right—and many highly regarded scholars think he is—prehistoric man was 15,000 to 30,000 years ago much more civilized and intellectually resourceful than anyone has till now suspected.

Original contributions or no, there will always be thousands of anonymous amateurs who, with no hope of fame or prizes, just like to sit in their garage or basement or attic workshops, gazing in wonder at the new vistas that open out constantly under the microscope. Fortunately, microscopy is an escalator that you can step onto at any age, no matter what your income, background, educational level or previous condition of boredom. If my own experience is any sort of guide, it is an escalator you'll never want to step off.

Microscopes for any budget: student 'scope at left, fine for beginners and amateurs, sells for $28 to $42; laboratory instrument, center, can cost up to $4,000; or you can spend $15,000 for research model, right.

Simulated situation based on actual incident

"THANK GOD AND THANK VOLKSWAGEN."

And we thank Brian Regrut for writing us the following letter about his Dasher.

Gentlemen:

Please pass along my thanks for your negative steering axis (or whatever it is called) to your engineers back in Germany. It helped keep me out of big, big trouble.

Many West Virginia roads, particularly those in the southern part of the state are bad. Unfortunately, I have to travel these roads during the course of my business.

Fortunately, I occasionally drive the mountains in my Dasher. (I usually drive a big company car.) The Dasher's size affords me the luxury of staying on the road when a coal truck passes in the other direction. And in the Dasher, I've always been able to dodge pot holes without spinning out of control, and to traverse the roads in bad weather with assurance.

Traveling home recently on these bad roads, the sidewall of my left front tire blew out while I was driving at about 50 miles an hour. Faced with on-coming traffic on the left and a steep drop off the pavement on the right (40 feet down through the trees to the river), I braced for the worst. It never came. In fact I had little trouble maintaining control as I slowed to about 10 miles an hour and drove for about a quarter mile to a tiny spot where I could get most of the car off the road.

Finally, I was back on the road, thanking God that He was with me during the emergency, and thanking Volkswagen for designing a front end that helped me stay on the road.

With warm thanks,

Brian Regrut

VOLKSWAGEN DOES IT AGAIN

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Major pieces reside easily in front of two of world's major museums. Above, *Two-Piece Reclining Figure: Points,* bought for the Hirshhorn opening in 1974.

At entrance of the National Gallery's East Building, and commissioned for it, *Knife Edge Mirror Two Piece* (below) is believed to be Moore's largest work.

By John Russell

Henry Moore at eighty—many happy returns

Hirshhorn Museum and Sculpture Garden joins international celebrations for the master with a show of its extensive collection

When the eightieth birthday of Henry Moore, the British sculptor, fell due on July 30, it was marked in London and elsewhere by scenes of decorous jubilation. There was a general feeling that Henry Moore had deserved well of art, deserved well of his country and, in a more general way, deserved well of just about everyone. For it is a great thing to be before the public uninterruptedly for the best part of half a century and still stand up, erect and uncontaminated, as a completely honorable human being. It may well be the case—so people decided on July 30—that Henry Moore has done as much for the good name of England as anyone now living.

(In Washington the Hirshhorn Museum and Sculpture Garden marked the day with a special exhibition of *its* Moores, one of the world's distinctive collections of the artist's work. The Hirshhorn show opened appropriately enough exactly on July 30 and will run through September 22. In addition to 55 sculptures, it contains a generous viewing of his drawings and prints.)

This is not simply a matter of art history, though Moore earned his place there as early as 1931. It has nothing to do with the market, though a major piece by Moore will dig deep into half a million dollars. It is not even a matter of distribution, though sculptures by Moore can be found in most of the world's great cities. It has to do with the stance before life which Moore has maintained throughout his long career.

To understand that stance, we must remember that Moore is by birth a man of the 19th century. He has

Mobile, engaged and engaging, two months before his eightieth birthday, Moore came to Washington to supervise installation of the East Building piece.

Going strong at eighty

Mother and Child, alabaster, 1931: ". . . I have had an obsession with the Mother and Child theme."

Victorian traits, and stoutly does he uphold them. He believes in fixed loyalties, where other human beings are concerned. He sticks to a certain plainness and stubbornness of statement, whether in his work or in conversation. Where public life is concerned, he believes that the lot of mankind can be changed for the better and that it is our duty to try to bring that about. He would go very well into a novel by George Eliot, and not at all into a novel by Evelyn Waugh or Graham Greene.

Yet for much of his life this same Henry Moore was Mr. Modern Art in England, with all that implies in the way of ridicule and obloquy. (Only a few years ago, one prominent English personality roused an acquiescent hee-haw by saying in public that one of Moore's sculptures reminded him of the gallstones of a monkey.) Moore was nearly fifty before he made anything like a good living from his work. Moore had to make sense of the modern movement single-handedly and at a time when books, magazines and exhibitions were all in very short supply. Modern art was not easy to find in England if you grew up, as he did, in a small mining town in Yorkshire before 1914. He was the son of a man who had got away from the pit-face by mastering, unaided, the mathematical and technical skills that he needed to become a mining engineer.

Henry Moore didn't go to a famous school, but from more than one of his teachers he got an irreversible moral and intellectual support. "Such people are there all the time," he said once, "for everybody, if anyone wants to find them."

In a small way he was much in demand among his school friends as a carver and modeler, whether in clay or in wood. There, attitudes were formed that came to the surface in some of the more cryptic of his sculptures in the 1930s. Something about the act of carving and something about the name of "sculptor" seemed to him so innately and self-evidently right for his particular nature that before long he made up his mind that he would spend his life doing just that.

Teacher, soldier—finally art student

His parents took it very well, though nothing could have seemed more outlandish in that place and at that time. They simply said that it would be a good thing if (like several of his brothers and sisters) he could qualify as a schoolteacher and have that possibility to fall back on. In 1916 he did in fact return as a teacher to the elementary school which he himself had attended as a small boy. And then, in 1917, he joined the army. He was gassed at Cambrai and had to spend three months in a hospital. But "on the whole I enjoyed the Army" is as much as he will say about it.

When he got back to Yorkshire in February 1919, it

was as a seasoned soldier who was coming up for his twenty-first birthday. Moore eventually got to art school in Leeds in September 1919, and there benefited from the presence of one of the most genuinely civilized men in England, Sir Michael Sadler, vice-chancellor of Leeds University. No one in England had a firmer grasp of modern art than he. And Sadler was as interested in English artists as he was in the great Europeans.

Like everyone of his caliber, Moore was powered by an inner energy that turbined away irrespective of stimulus from other people. But he had luck with other people all the same, and he has never lost it. He had luck with Sir William Rothenstein, who was principal of the Royal College of Art in London when Moore got there in September 1921. There were few people of consequence, from Degas and Rodin onward, whom Rothenstein had not known; and he believed in throwing his students in at the deep end and seeing what came of it. Thus it was that, at an age when Moore might still have been a schoolmaster in a tiny school in Yorkshire, he found himself standing on the Rothensteins' hearthrug with Ramsay MacDonald, Prime Minister of Great Britain.

He didn't at all mind that, but what aroused his sense of wonder to the fullest was London itself. "When I rode on the open top of a bus," he said not long ago, "I felt that I was traveling in Heaven almost, and that the bus was floating in the air." He was receptivity personified. But it was with art as it was with people: he knew how to pick and choose. By the time he made his first visit to Paris in the summer of 1922, he knew what he wanted of art, and of himself. Even the most formal personal contact seemed to him an intrusion. (Rothenstein had given him a letter to Aristide Maillol, but Moore gave up when he got to the door of Maillol's studio. "After all," he said later, "Maillol might have been working.")

In January 1925 he went to Italy for the first time, on a traveling scholarship. "In Italy," he said later, "there was just too much richness, too much to sort out all at once. I knew, even then, that it had to be done, and that the richer an artist's work was, the more he would turn out to have garnered from all over. . . . But at that time, it was an ordeal."

He had to take his ideas one at a time, and in his own way. "If you're keyed up," he once said, "as you ought to be when you're doing sculpture, you get into such a state of comprehension, or appreciation, of everything around you that the only way is to concentrate on that one idea. If you don't, it's almost

Author of many books on art, including one on Moore, John Russell, art critic for the New York Times, *wrote about Matisse in* SMITHSONIAN, *September 1977.*

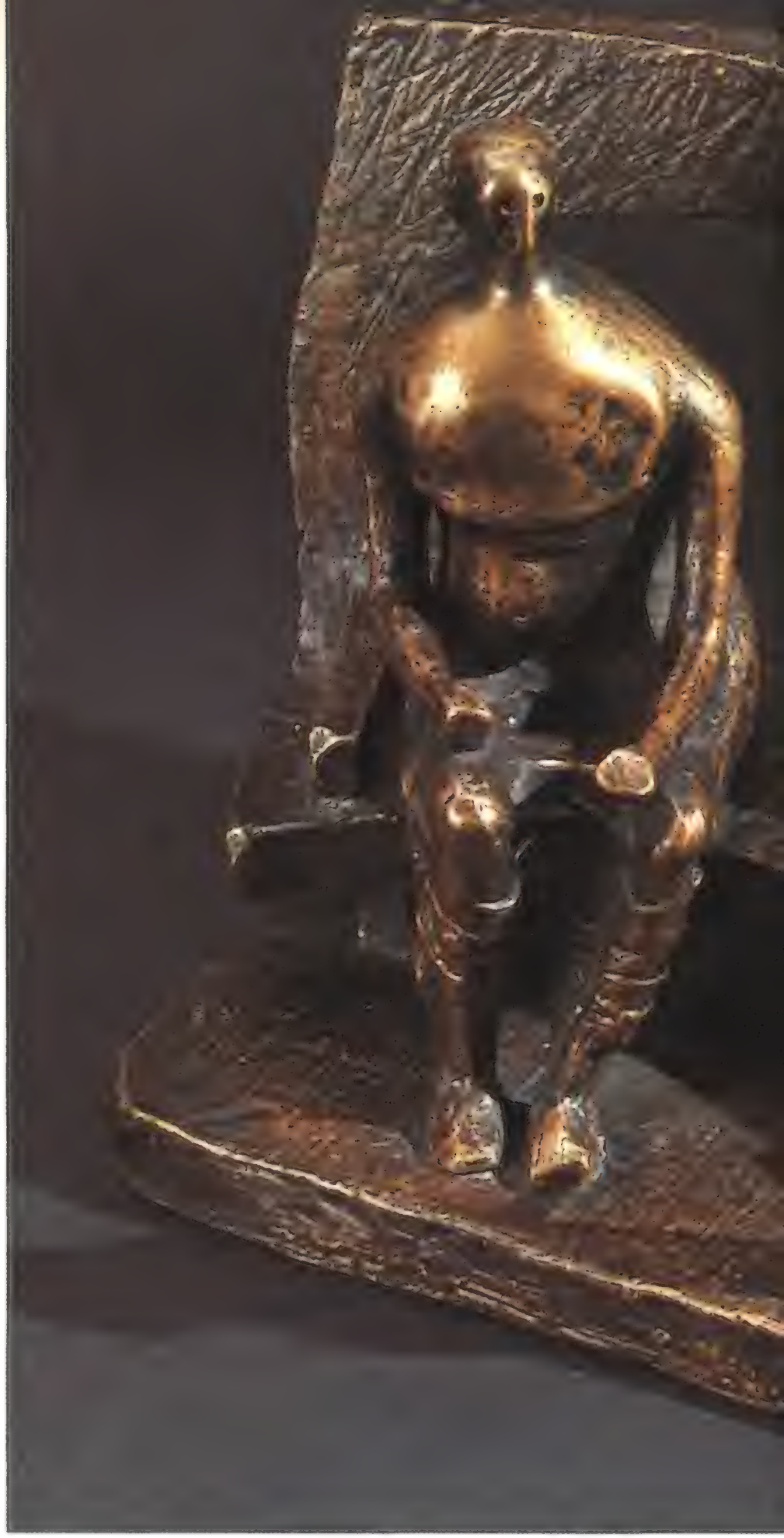
Upright Motive No. 1: Glenkiln Cross. Moore: "A kind of worn-down body and a cross merged into one."

impossible to go on living. If you let everything in, and if you try to follow up all the ideas for sculpture that come flooding in at such times, you'd just burst."

Exactly 50 years ago, in 1928, Moore had his first one-man show in London. Thereafter, work flowed from his hands. There were times—even in his forties—when he could not afford the materials for a big sculpture; but there does not ever seem to have been a time when he couldn't think what to do next. He was—and is still—like a self-winding watch that ticks away year after year and keeps perfect time.

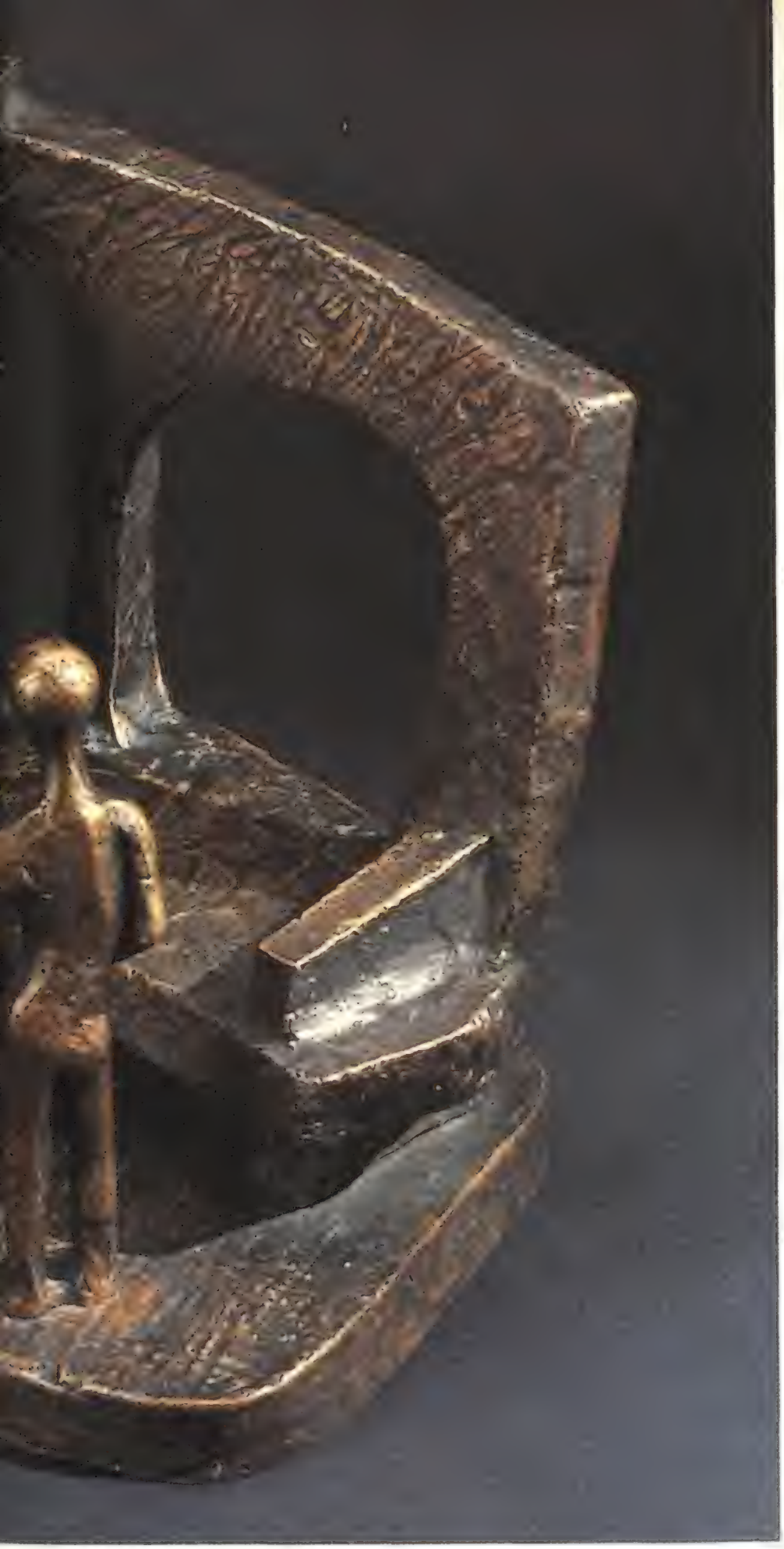
Sculptors are like everybody else, in that their spirits go up and down. But there is something steadying and restorative about the sheer physical exertion of making sculpture in the traditional ways—carving, modeling, welding, working on bronze casts, manhandling heavy materials and in general doing a day's work that would leave many a longshoreman faint with exhaustion. That was the kind of day's work that Moore delighted in for many years and would still be doing today if nature did not say "No." Up to the end of World War II he hardly ever had his work cast in bronze. He produced unique pieces, either in wood or in stone, and in those unique pieces effort was not disguised. They were difficult to make, and if the difficulty showed, he didn't care: "Great sculpture is not about perfection," he said.

The audience for work of this kind in England in the 1930s was not large. In fact, it was left to American collectors to show a distinguished prescience in their attitude to Henry Moore. Some of the sculptures they bought have lately come back to England—it is not everyone who can resist a profit of 10,000 percent—but, for a generation or more, much of Moore's finest and most provocative works could be seen only in the United States. And his was an output that needed to be known in its entirety. Quite apart from the elements I have already mentioned, there was to be reckoned with from 1931 onward something that still predominates from time to time, and that is the fact of accident.



Monumental in mood, small in size, *Mother and Child Against Open Wall,* 1956, is only about

Accident is not something that figured in the curriculum of European art schools in the 1920s. But it figured very much indeed in the work, and in the



8 by 11 by 7 inches. Moore: "Using a wall with sculpture presented some interesting problems."

Moore: "The rocking chair sculptures were done for my daughter, Mary, as toys which actually rock."

esthetic, of the European surrealists. They had learned from Sigmund Freud that what we call "accident" often corresponds to our deepest instincts and unacknowledged desires. Moore was not at any time "a surrealist" in the sense that Max Ernst and Joan Miró and the young Salvador Dali were surrealists, but he was in touch with the times, and he knew that when a cryptic notion came into his head and wouldn't go away it should not be discouraged.

In this way it happened that in the 1930s Henry Moore produced a number of carvings which even today keep their secrets intact. If he knows what those secrets are, he isn't telling. If Professor This and Doctor That try to riddle them out in some learned publication, Henry Moore doesn't bother to read them.

They were much in tune with the times, those early carvings. The effective audience for them might number about 16 people, but they were 16 people who counted: in England, in France, in Germany, in the United States. Moore didn't get to be famous, and still less did he get to be rich; but he got to be known, and at the time when the world of modern art was still something of a secret society, he was one of the very few English artists who were taken seriously by founder-members of the modern movement.

World War II transformed his reputation even more radically than it transformed his activity. The solitary and problematical artist of 1939 turned by 1945 into the keeper of the national cultural conscience.

Anyone who thinks that this is the kind of rodomontade that gets talked on people's eightieth birthdays should consider the evidence. Moore's popular reputation was owed in the first place to the "shelter drawings" which he produced in 1941. At a time when a great part of the population of London was spending the night below ground, Moore went among them with his sketchbooks and gave a timeless grandeur to what was in reality a scene of humiliating passivity. Moore took the idiom of his own earlier life-drawings and of some of the more naturalistic of his carvings and proved that it could be adapted to "real life" in one of its more disagreeable aspects. And the British people never got over it. Antiheroic by nature, they didn't want their posture to be shown as anything other than it actually was: the only rational way to see the night through. But when Moore was able to raise those tedious hours below ground to the scale of epic, they felt that what they were doing made a kind of superior sense.

It was also during World War II that Moore began to work on the motif of shared tenderness that led to some of his most popular pieces. At a time when people all over the world wanted to feel that there would be a future in which family relationships would once again be secure and lasting, Moore was just the man to encourage them. Himself blessed from birth with a singularly happy and united family life (and one which is still an inspiration to his friends), he could turn without strain or incongruity from the enigmatic carvings of the 1930s to the family groups—at once serene and all-enduring—of the 1940s.

World War II was like every other war in that its aftermath was neither as clear-cut nor as constructive as people had hoped for at the time of the armistice. Human experience turned out to be exactly as it had been before: discontinuous, contradictory and, in almost every way, bothersome. Evil had not been banished. Fear and hatred stalked the world. After Auschwitz, it was difficult to believe that human nature had not suffered an irreversible contamination. The healing quiet for which people had hoped was nowhere to be found.

These were the conditions in which Henry Moore gradually abandoned the simplified and lyrical imagery of the 1940s and began to look at human experience in terms of difficulties to be endured and contradictions to be faced without equivocation.

It is in this sense that Moore's postwar activity can best be interpreted. It is not a matter of "modern art" as "modern art" existed in the 1930s. It is a matter of the survival of human self-respect in a world that con-

In Hertfordshire studio, 1954, Moore works at version of one of a series of stricken warriors.

Here is the sculptor's *Falling Warrior,* 1956-57, joining formal volumes and deep human memories.

tinually puts that survival at risk. Moore has no one idiom, no one style, no one general answer to the problems which people continually lay before him. He takes those problems one by one, and day by day. If what presents itself to him is ugly, he does not shirk its ugliness; snouts and tusks, wrenching and severances, forms fragmented almost beyond recognition—all these are present in the late work. But Moore has also dared on occasion a directness and simplicity of statement that "modern sculptors" would reject as impossibly naive. Anyone who visits the major repositories of Moore's work—the Tate Gallery in London, the Hirshhorn Museum and Sculpture Garden in Washington, the Art Gallery of Ontario in Toronto—can soon convince himself of this.

Moore in his seventies was heaped with just about every honor that the world could offer. The city of Florence invited him to match himself against the best that Florence itself had to show. The city of Paris invited him to take over the gardens of the Tuileries. The city of Vienna invited him to place a big sculpture in perpetuity in the Karlsplatz, just in front of Fischer von Erlach's Baroque masterpiece, the Karlskirche. In front of the new East Building of the National Gallery in Washington there is just one sculpture, and it, too, is by Henry Moore.

Preeminence of this kind does not always make people loved. You will not have to go far into the art world to find people who think that Moore is very much overrated, and there is something ridiculous and demeaning in the almost universal taste for his work among the international Establishment. As for Moore's longtime admirers, they do on occasion undeniably form a kind of Adulation, Inc., that does not endear itself to outsiders.

But Moore himself is just as he always was. To a remarkable degree, he has been untouched by fame and untouched by money. He lives in the same house, he eats the same food and he sees the same people, and every morning when he is at home he goes off into the same tiny room, sits down (in winter) before the same postcard-sized English electric heater and gets to work on whatever idea is preoccupying him. The fixed stars in his universe are his wife (the Moores were married in 1929), his daughter and his little grandson. There is no limit, at this stage in his career, to what the world would gladly do for him. But he doesn't want any of it; and at a time when human nature ebbs and flows between hysteria at one extreme and inanition at the other, we prize him all the more as someone who proves that we are still free to choose, if we wish an alternative destiny.

By Donald J. Ortner

Cultural change in Bronze Age

Jordanian burials, 5,000 years old, show a turning point in our history and are part of Smithsonian display on civilization

A new hall tracing the rise of Western civilization opened recently at the Smithsonian's National Museum of Natural History. Beginning with cave paintings in Spain and ending with the glory of the Acropolis, it follows a critical transformation in human cultural evolution. Two windows in that hall look in on the remains of people buried 5,000 years ago in Jordan, arranged just as they were left in underground tombs. This account of tomb excavations is a very good example of how Smithsonian scientists conduct research.

In the desert plain that rises gradually from the shores of the Dead Sea in Jordan lies the ruin of an Early Bronze Age fortified town, which some early explorers thought might be the Biblical city of Sodom. Today this site is called Bab edh-Dhra, and scholars are trying to reconstruct the cultural and biological history of the people who lived there between four and five thousand years ago.

Some of the most significant events in the history of Man were taking place during this period, as cities

in the Near East began to develop into a dominant feature of the emerging civilizations of Sumer in Mesopotamia and Dynastic Egypt. The cultural changes associated with this development often have correlates in Man's biological history.

Less than a kilometer south of the Bab edh-Dhra is a large cemetery, where many thousands of people were buried. The tombs and skeletons offer evidence of the cultural and biological changes occurring with the emergence of city life at Bab edh-Dhra. On an expedition to the site last year, I coordinated excavations of the cemetery, collecting human skeletons for subsequent research.

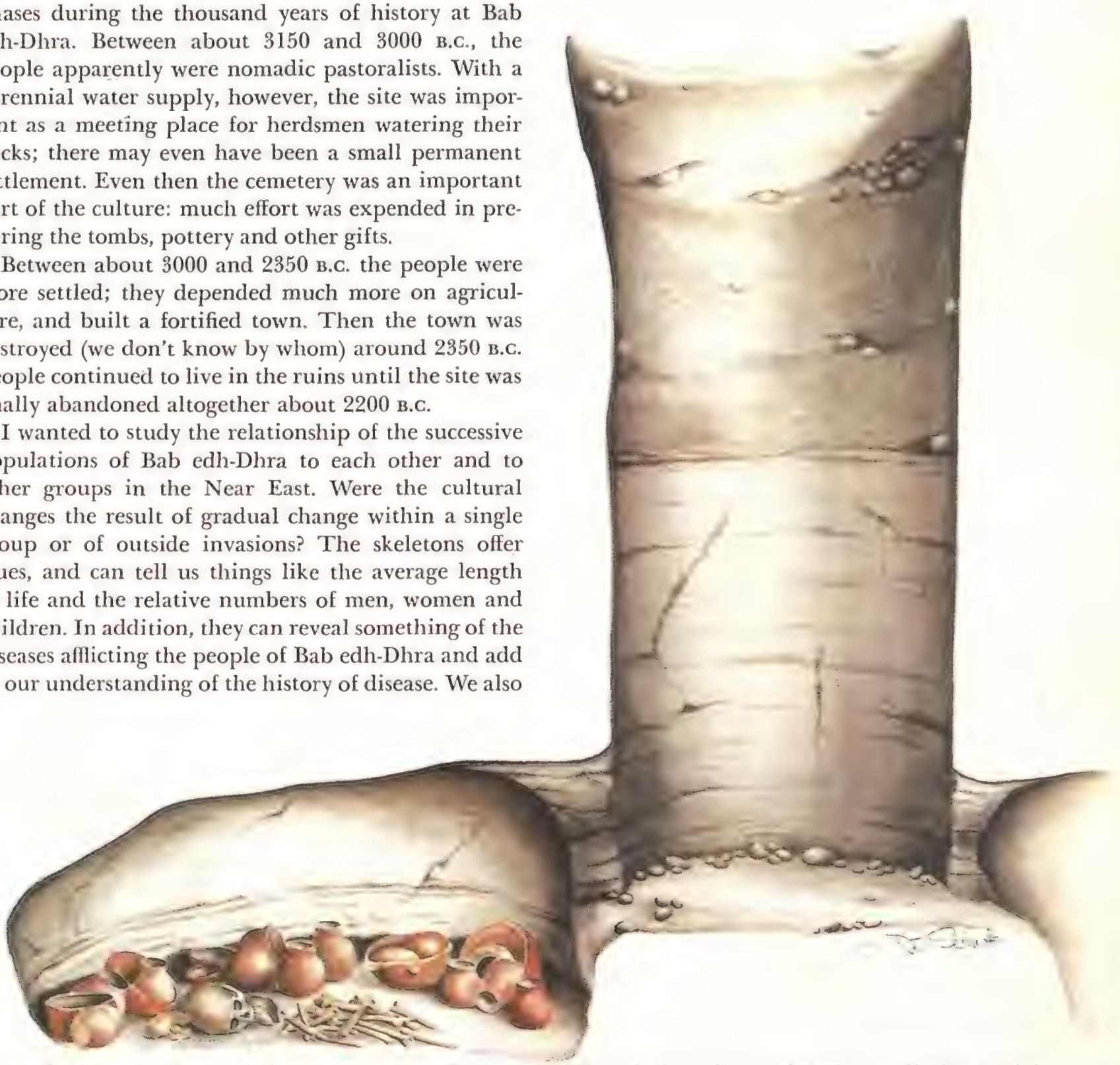
Earlier work had suggested three major cultural phases during the thousand years of history at Bab edh-Dhra. Between about 3150 and 3000 B.C., the people apparently were nomadic pastoralists. With a perennial water supply, however, the site was important as a meeting place for herdsmen watering their flocks; there may even have been a small permanent settlement. Even then the cemetery was an important part of the culture: much effort was expended in preparing the tombs, pottery and other gifts.

Between about 3000 and 2350 B.C. the people were more settled; they depended much more on agriculture, and built a fortified town. Then the town was destroyed (we don't know by whom) around 2350 B.C. People continued to live in the ruins until the site was finally abandoned altogether about 2200 B.C.

I wanted to study the relationship of the successive populations of Bab edh-Dhra to each other and to other groups in the Near East. Were the cultural changes the result of gradual change within a single group or of outside invasions? The skeletons offer clues, and can tell us things like the average length of life and the relative numbers of men, women and children. In addition, they can reveal something of the diseases afflicting the people of Bab edh-Dhra and add to our understanding of the history of disease. We also wanted to find out all we could about burial practices and what they could tell us about social structure.

During the pretown phase at Bab edh-Dhra, the dead typically were placed in shaft tombs (below). Shafts four feet across were dug as deep as nine feet. Near the bottom the tomb makers would dig laterally, creating a small entryway just large enough for one person to squeeze through. Beyond, they excavated a domed chamber about six feet in diameter and three feet high at the center. As many as five of these chambers might open off a single shaft.

Typically, we found the bones of three or more



The bones of a 40-year-old man lie in an underground tomb in Jordan, undisturbed for about 5,000 years. Cemetery was the first permanent site of these nomads.

The relation of central shaft to radiating burial chambers is apparent in reconstruction. Those who died elsewhere were reinterred in such tombs.

Cemetery and ruins of ancient fortified town of Bab edh-Dhra lie east of the Dead Sea in Jordan.

Ruins of Early Bronze-Age town, once thought to be Sodom, are at (1). Circular burial houses were

individuals in a single chamber. Except for the skulls and lower jaws, all the bones would be intermingled. This means, of course, that bodies had been reduced to skeletons before the bones were entombed. Perhaps bodies were temporarily buried where people died, and the bones were recovered periodically and brought back to Bab edh-Dhra for appropriate ceremonies and permanent burial. Several of the skulls had been slightly broken during this second burial, indicating that the first burial had lasted long enough for the bone to become rather fragile.

Around the periphery of the chambers were pottery vessels and other tomb gifts: stone mace heads, wooden shafts and bowls and unfired clay female figurines. Contrary to the expectations of some scholars, we found evidence of food offerings in vessels. One sealed jar contained protein residues, probably of animal origin. We also discovered grape seeds.

During the urban phase at Bab edh-Dhra, the people started building mud-brick burial houses at or near ground level, first round ones and later rectangular. These were generally much larger than the shaft tombs and contained many more skeletons. After the town was destroyed, underground stone-lined cists and a new type of shaft tomb emerged as the typical tomb architecture.

We concentrated on the early shaft tombs. One of the courtesies given me was that of opening the first chamber we excavated, in a shaft we designated A78 (p. 87). I shall never forget the exhilaration. Covered with dust, perspiration rolling off me in the 100-degree-plus heat, I pulled away the stone blocking the north chamber and saw revealed for the first time in 5,000 years the human skeletons and exquisite pottery inside. It was as if I had stepped back in time and was participating in the ancient ceremony.

Just inside were the skull and long bones of an infant. Skeletons in the center included the bones of a child about nine years old and two adult females. While some of the bones were missing or broken, it was clear that considerable effort had been made to gather the small bones and broken pieces and place them in the chamber. Some were in a bowl; others, almost whimsically, were in the broken top of a skull.

Our expedition stayed at Karak, a town about a half-hour's drive from Bab edh-Dhra. In the ancient Crusader castle and adjacent rest house, our staff ate, slept, held evening seminars and set up temporary laboratories. The temperature at Bab edh-Dhra became almost unbearable by midday, several times exceeding 120 degrees, so we tried to be at the site by sunrise and finish by noon. This meant getting up at 2:30, about the time devout Muslims were called for their morning prayers. After a brief breakfast, we

An anthropologist at National Museum of Natural History, Ortner studies evolution and paleopathology.

built at (2), while rectangular ones are at (3).
Shaft tombs at (4) are older than the town itself.

Author, crouching at center, inspects test trench.
His wife and daughters, rear, found one tomb.

drove from Karak to the site, dropping from 3,150 feet above sea level to 850 feet below. About this time the sun was just beginning to reveal the plain around Bab edh-Dhra, dotted in the early morning light with cooking fires beside Bedouin tents.

Hot, dirty and tired, we returned to Karak by 1 P.M. for showers and a midday meal. In a country as hot as Jordan, I still do not know where they obtained the icy water, all that flowed through the shower head. Early afternoon was meant to be a rest period; late afternoon was devoted to laboratory work such as pottery identification and bone numbering. The bones were so fragile that they had to be treated with a plastic solution before they could be handled. After the evening meal came meetings and seminars or efforts to catch up on field notes and other expedition business. We were ready for sleep by nine, although braying donkeys, barking dogs and noisy neighbors often kept us awake until midnight.

The work became routine, but each day brought something that was not. While most of the shaft tombs we excavated were like the north chamber of A78, the north chamber of A100 was a surprise. Here we found the complete, articulated skeleton of a man about 40 years old. He was lying on his right side in a slightly flexed position with his hands carefully placed together. Clearly, the body had been put in the chamber when the man died, not a year or two later.

The skull had two depressions, each about an inch across and less than a quarter-inch deep. Both were probably the result of a depressed fracture caused by the proverbial "blunt instrument," and both had healed completely. We can be sure he suffered an occasional headache, compounded by pain from an upper molar that was almost completely decayed.

This primary burial in tomb A100 may mark the time when Bab edh-Dhra was changing from a nomad center to a more permanently settled town. The codirectors of the expedition, Walter Rast of Valparaiso University and Thomas Schaub of Indiana University of Pennsylvania, believe the pottery found in A100 is closer to the urban phase. With more people living near the cemetery, more would be buried there immediately after death.

The east chamber of A100 yielded most of the evidence of disease found so far. As soon as I looked in that chamber, I noticed a fused tibia and fibula (lower leg bones) with abnormal surface texture indicative of a chronic bone infection. Analysis of other bones later at the Smithsonian identified a probable case of tuberculosis in which part of a spine had been destroyed before death. Another skeleton had evidence of traumatic hip dislocation with partial destruction of the bone and arthritic degeneration of the joint.

We didn't confine our data gathering to the excavations. Strong oral traditions persist in Jordan, particularly in the more isolated towns and villages. The late

Nelson Glueck, a pioneer in the archaeology of the Jordan Valley, tells of villagers reciting historical details going back 40 generations as if they had happened the day before. I wanted to hear some of these oral traditions from the older men in the town of El Mazra, where many of the laborers working at the site lived. Muhammed Darwish, one of my Jordanian colleagues and a skilled excavator, knew such a man, Mahmoud Mustafa, a close friend of Muhammed's father. Near the end of the field season, Muhammed made arrangements for me to interview Mustafa about contemporary and ancient burial practices.

In the more isolated regions of Jordan, such as that around El Mazra, Westerners unaccustomed to the local intestinal bacteria are prone to severe and debilitating illness. Knowing the proverbial hospitality of the Arabs, I had insisted to Muhammed that I would not be able to drink the ceremonial tea or eat any food. I lost the first round as soon as we arrived at Mustafa's house, where we were immediately served the scalding hot, mint-flavored, sweet Bedouin tea.

With Muhammed translating, I obtained some very useful information suggesting that contemporary Bedouin customs go back at least to the time of the Prophet (A.D. 570-632). I personally believe that many aspects of their burial practices can be traced to the Early Bronze Age. For example, there is still a strong tradition of bringing the remains of the deceased back to the tribal homeland. One difference is that in El Mazra today males and females would not be buried in the same tomb.

As soon as the interview was over, our host insisted on serving a meal. Muhammed was almost like a member of the family and could hardly refuse. At the same time, he well understood the reality of my fears. I tried to decline but learned that no excuse was acceptable. Rudeness was inconceivable, so, with a muttered apology to my gastrointestinal tract, I also lost the second round of my social confrontations.

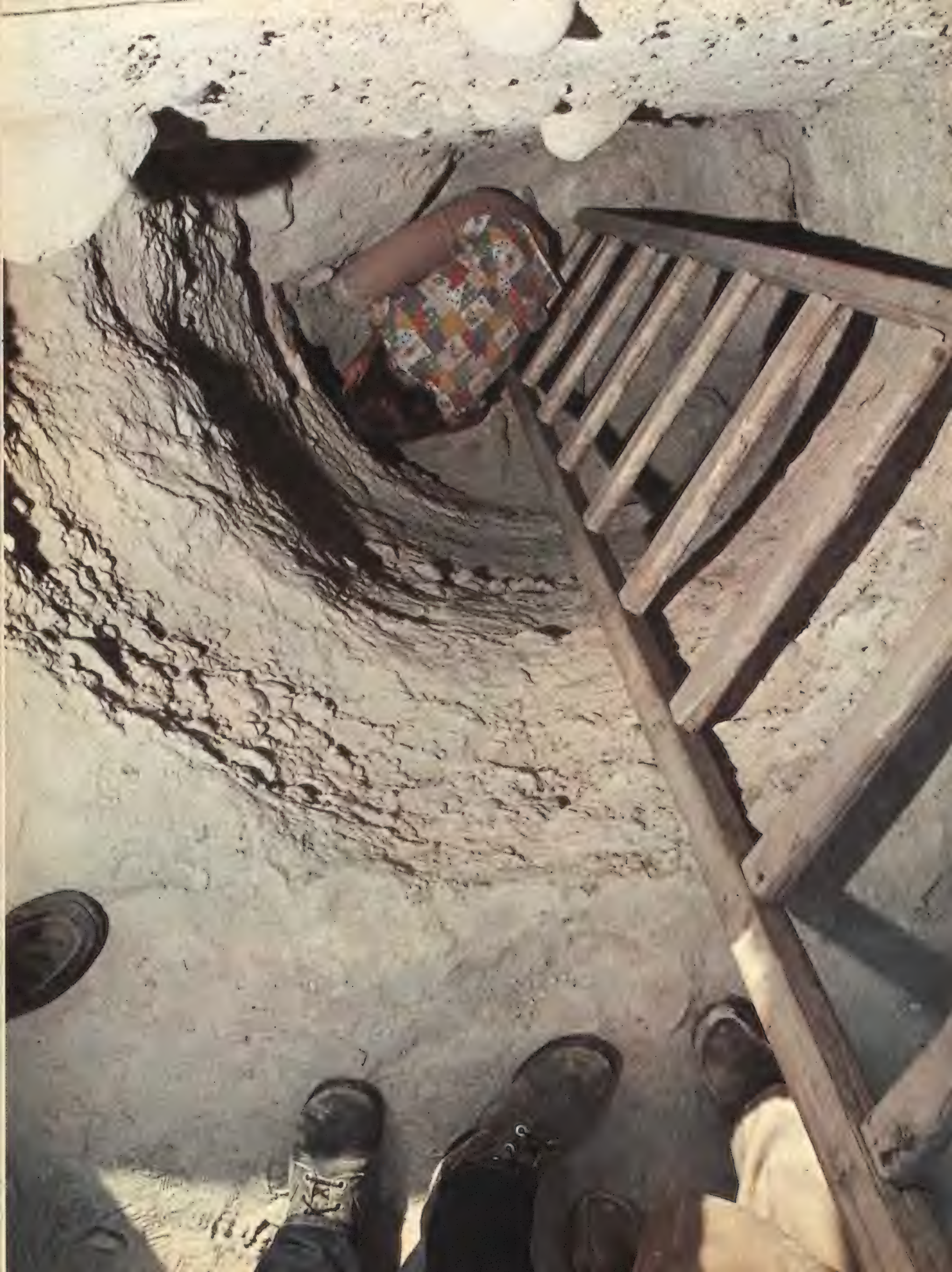
One of our host's sons brought in a large pan with soap and towels, and poured water so that each of us could wash our hands. Mustafa brought in the Bedouin bread, which we had seen his daughters-in-law making earlier, and chicken that had been prepared in a sort of stew with potatoes, onions and tomatoes. Pieces of the flat bread are broken off and the stew is spooned onto the bread. We ended with more Bedouin tea. My fears for my health proved groundless, and the meal at the home of Mahmoud Mustafa will remain one of my most memorable events.

Of the several objectives in excavating the cemetery at Bab edh-Dhra, one remains to be mentioned. As I was planning for the expedition, colleagues in the Smithsonian's National Museum of Natural History were developing a new permanent exhibition on the rise of Western civilization. While not a major center, Bab edh-Dhra typifies, in many respects, the trend toward urbanization.

Through the courtesy of the Jordanian Department of Antiquities and its director, Dr. Adnan Hadidi, the Smithsonian has acquired, either outright or on long-term loan, the entire contents of six shaft tomb chambers. The north chambers of Tombs A78 and A100 have been reconstructed in the new hall. The original skeletons and pottery are exhibited much as they were found. Because of this gift, visitors to the Smithsonian will be able to share the wonder and mystery of a ceremony that took place 5,000 years ago.

Author, center, shares a meal with Muhammed Darwish, at left, host Mahmoud Mustafa and a cat.

At bottom of shaft tomb A78, Allison Ortner was one of the first to peer into the north chamber.



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An acclaimed artist whose style combines uncompromising accuracy with a mastery of form and color, Jeanne Holgate works directly from the living flower. Thus, she is able to depict each wildflower exactly as it is in nature. So completely true to life that the tiny creatures she so joyfully portrays approaching her flowers are never a surprise to the viewer. For this is where the bumblebee and the grasshopper truly *belong*.

The result is a collection of beautiful works on porcelain—so lifelike that each is aglow with the inner beauty of the flowers themselves. A collection that will bring the beauty of our country's wildflowers into the home, where it can be enjoyed—year after year—by every member of the family.

The delicate size enhances each original design

There will be twelve porcelain plates in this historic Sierra Club collection. Each will measure 7¾" in diameter, a size chosen especially to enhance the delicate beauty of its subject. And every design will delight the eye with its clear and uncomplicated beauty.

Each of the twelve plate designs will portray the loveliest wildflowers of a different region of our country, from the enchanting *Lady's Slipper Orchid* of the New England woods to the *California Poppy* that grows in profusion along Pacific shores . . . and from the charming *Forget-me-not* that brightens the Alaskan plains to the graceful *Water Lily*, glory of the Florida Everglades.

Thus, together, the complete collection will portray America's most distinctive and beautiful wildflowers—in a form destined to remain forever fresh and fascinating.

Crafted of the finest porcelain

Each plate in the Sierra Club collection will be individually crafted of fine Bavarian porcelain, prized throughout the world for its whiteness, its translucence and its enduring strength. *And every plate in the collection will be individually decorated with a rich border of pure 24 karat gold.*

The Sierra Club has appointed Franklin Porcelain, a division of The Franklin Mint, as the sole issuing authority for this, its first collection of porcelain plates. And only those plates which meet the most demanding quality standards will be accepted for issuance.

Limiting the edition of fine porcelain plates

By order of the Sierra Club, *Flowers of the American Wilderness* will be produced and issued *only* by direct subscription. The total number of plates to be issued will be sharply and permanently restricted in the manner long ago established to assure the rarity of the finest porcelain plates. Thus, there is an absolute limit of just one subscription per person, and the total edition of the collection will be forever limited to the exact number of subscriptions entered by the official deadline.

As a subscriber, you will receive your plates at the convenient and systematic rate of one each month for a year. The issue price for each fine porcelain plate is just $39, and a display stand will accompany each plate.

A legacy of beauty

As fine porcelain to display in your home . . . as a collection of original works by a world-renowned floral artist . . . and as the *first* collection of porcelain plates ever issued by the Sierra Club, this will be a most rewarding acquisition.

And, because a truly worthwhile possession retains its appeal forever, this collection will also be far, far more. A legacy from you, to be passed along from parent to child, down the generations. A legacy that will—again and again—inspire a love of beauty and an appreciation of America's proud natural heritage in *all* who come to possess it.

But please keep in mind that the Sierra Club's *Flowers of the American Wilderness* plate collection is available for only a limited time. To subscribe, complete the application below and mail it by August 31, 1978.

There is no need to send any payment now. But please be sure your Subscription Application is postmarked no later than August 31st.

JEANNE HOLGATE's work is a permanent part of the great floral art collections of the world—including those of the Carnegie-Mellon University's Hunt Botanical Library, the British Museum, and the personal collection of Her Majesty Queen Elizabeth, the Queen Mother of Great Britain. She is the only artist ever awarded successive gold medals by the Royal Horticultural Society.

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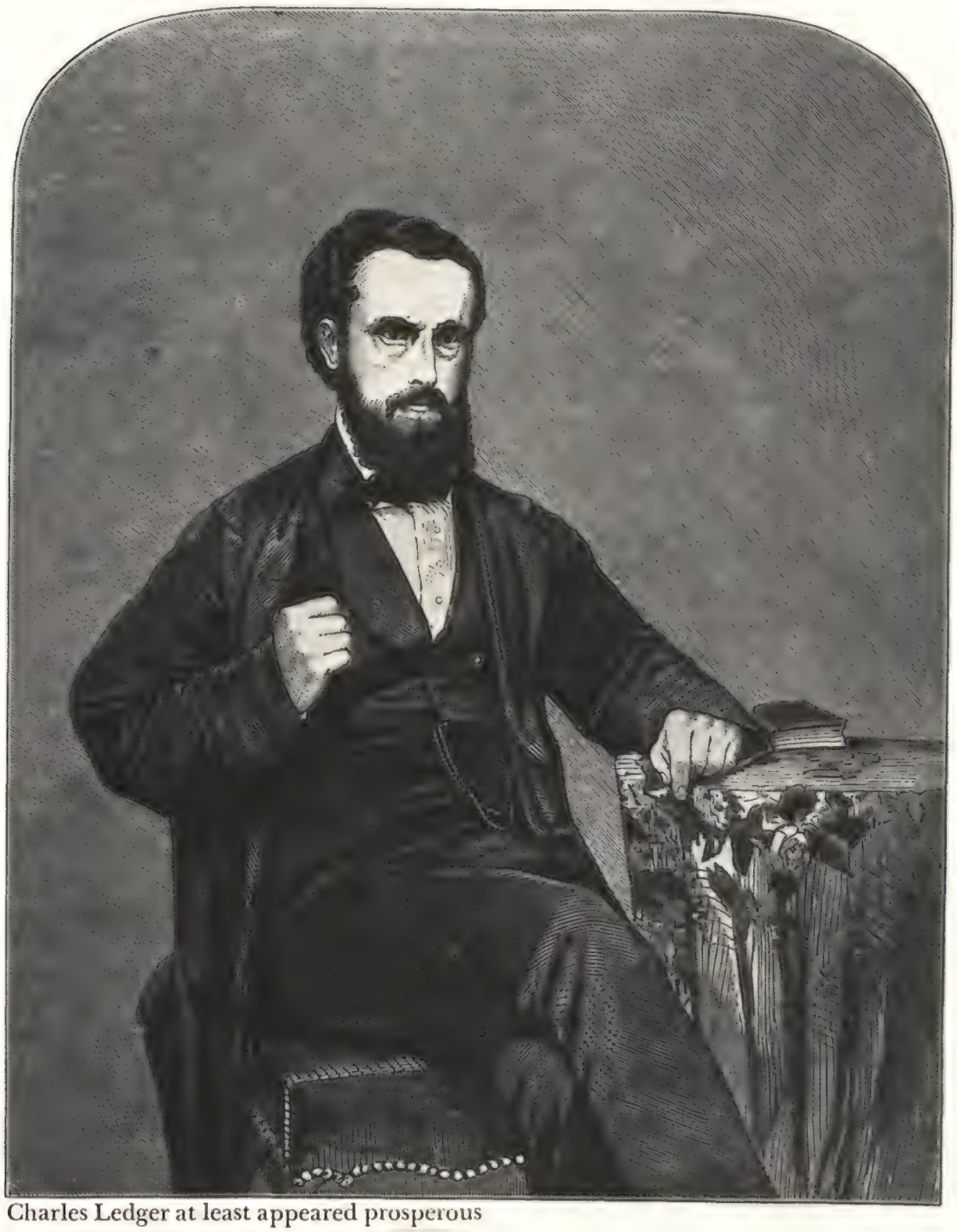
By Noel D. Vietmeyer

Incredible odyssey of a visionary Victorian peddler

Charles Ledger smuggled quinine and alpacas from South America, but the world was not ready for him

You won't find Charles Ledger listed in every encyclopedia. He is barely mentioned in histories of the countries he affected: Peru, Australia, India, the Netherlands and Indonesia. He died forgotten, with assets totaling about $10.

Yet Charles Ledger suffered incredible travail to offer the world what it now desperately seeks, a low-cost, ecologically sound way to make marginal land highly productive; and he made available to the world the drug—quinine—that according to the Encyclopaedia Britannica "has benefitted more people than any other drug used thus far to combat infectious diseases." Few people accomplish so much.



Charles Ledger at least appeared prosperous in an 1859 London newspaper engraving.

Born in London in 1818, Ledger sailed for Peru at age 18 to become a clerk in an English merchant firm. Six years later, in the city of Tacna, he founded his own business, trading in alpaca wool and skins, the bark of cinchona trees (the source of quinine) and copper. This new start would lead to the two great adventures of his life, one involving an animal, the alpaca, and the other involving a plant, the cinchona.

He had exceptional foresight and fervently desired to bring credit to the British Empire. Accordingly, in 1848 he rented a large estate near Lake Titicaca, high in the Andes; leaving his family behind in Tacna, he began with characteristic enthusiasm, determination and energy his alpaca adventure.

Ledger already knew much about the alpaca, a miniature cousin of the camel that grazes the slopes of the Andean highlands. Its soft, flexible wool has a sheen that gives the luster of silk to alpaca cloth. The animals thrive where few others can live, and require almost no attention. Ledger believed they would prosper in Australia, India and other parts of the Empire. He began raising alpacas, and to experiment by crossing them with llamas to increase their size.

In 1852 the British consul in Peru promised payment from Australia if he would export alpacas. In 1853, after instructing his servant Pedro Cabrera to begin collecting a larger flock, he sailed across the Pacific to the colony of New South Wales. There he found a large upland area seemingly ideal for alpaca raising and he informed Governor Sir Charles Fitz Roy that "I entertain the idea that this animal is destined to graze and browse on such elevated and inclement parts of this country, suitable only to themselves and goats and at present useless for the depasturing of other stock."

Fitz Roy verbally committed the colony to pay Ledger for any animals he could deliver and to provide 10,000 acres of farmland if he could successfully introduce 100 alpacas. Ledger returned to Peru and invested all the money he had made trading (more than $75,000) in the cause of naturalizing Andean alpacas on the hills of Australia.

He was taking an enormous risk. Ten

An associate of the National Academy of Sciences, Vietmeyer wrote earlier articles on water buffalo and manatees.

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A herd of alpacas beds down at sunset on a ranch at Cailloma, Peru, near

years earlier, Peruvian authorities had forcibly taken 400 alpacas from the Indians and shipped them to England; only three survived the voyage and they died soon after. The Indians blamed every subsequent misfortune on the removal of the animals, and the government then prohibited any future export of alpacas.

Thus Ledger had to gather his animals in secret. He and Indian companions roamed the wilds of Peru and Bolivia, slowly building up the herd until he had 1,000 alpacas, llamas, vicuñas and cross-breeds. Unable to ship them from Peruvian ports, Ledger and the Indians, with Pedro Cabrera as overseer, set off inland for the great mountainous backbone of South America, the high Cordillera.

For thousands of miles they drove the animals through the passes, going as high as 17,000 feet, skirting peaks and precipices. Through snow, ice and biting winds, men and animals traveled miles without fodder, fuel or water. Mules and donkeys froze; two of the shepherds fell to their deaths.

Twice Ledger was captured. Once he was freed after curing a local official's wife, and once he mixed an alcoholic solution of opium into his jailer's grog. A price of nearly $25,000 was put on his head. And yet he continued inching the alpacas out of Peru onto the eastern

the farthest source of the Amazon. They require almost no care by owner.

slopes of the Andes, then southward across half of Bolivia. He lost 500 animals in a nine-day snowstorm in the mountains, but kept going on to Argentina. Back in Peru, his wife had died, a loss he would not learn of until much later.

While resting the flock in Argentina, more than 200 precious animals suddenly died after drinking from a leech-infested pond. He had been away from home and family for years and was now almost penniless. But he decided to devote another year to the enterprise, leaving his flock and journeying across the Andes to Valparaiso, Chile, where he procured further financing.

He then returned to Argentina to drive the surviving flock back over the Andes into Chile. Emerging from the foothills, he and his animals faced the fearsome Atacama, one of the driest deserts on Earth. For weeks the men drove the flock through the summer's heat. Yet at one point, after 22 days without water, these cameloid animals were so unaffected that Ledger reported that "on arriving at water they showed a greater inclination to bathe in than drink it."

In April 1858 the party reached the Chilean coast at Copiapo and the whole town turned out to gawk. In July Ledger, Cabrera, seven shepherds and the animals embarked from the port of Caldera on the sailing vessel *Salvadora*.

At first the animals suffered seasickness, but after four months at sea 274 were landed in Sydney on November 28, 1858. The New South Wales government was ecstatic. Ledger was feted. Public dinners were arranged at which hundreds of the elite tasted and approved alpaca meat. Ledger and Pedro Cabrera toured the colony looking for land suitable for alpaca raising. In the Monaro Range—not far from where Canberra, the capital of Australia, is now—they found mountains so ideally suited that both of them could believe they were back in Peru.

The flock had journeyed thousands of miles, but for some reason the government, which now purchased the flock for $75,000, refused to let Ledger and his shepherds drive it the last 100 miles to the mountains. Despite Ledger's constant pleading, the officials insisted that the animals be kept in lowland country near the river town of Goulburn.

Although the Goulburn climate was alien, the flock thrived, confirming Ledger's contention that alpacas would acclimatize to the environment and native grasses of Australia. Within six months all the animals were back in good condition and 49 lambs had been born. Ledger was made superintendent of the flock at an annual salary of a little more than $1,500 (later raised to about $4,000) with $5,000 to cover all expenses,

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A watercolor by Santiago Savage, from a sketchbook of Ledger's adventures

including the shepherd's salaries. He went back to Peru to collect his children and then, returning quickly to Australia, he continued his crossbreeding experiments. By 1861, his animals numbered 417 and most were larger and better looking than their average Peruvian counterpart. Wool yields were much higher than in Peru: Ledger projected that in 50 years the flock would have increased to almost 10 million head, producing a clip of more than 68 million pounds.

But obstacles remained. Ledger could keep none of the money paid for the animals: the $75,000 went entirely to the Valparaiso merchant who had earlier bailed him out. He asked for an additional $35,000 to cover his expenses during the years spent in getting the flock to Chile, but was turned down. He requested permission to buy back the flock. This too was rejected. He requested permission to move the animals to the mountains. The officials would not allow that either. "On the faith of promises made in this country and in Peru," he said, "I undertook every risk—did succeed—and am ruined!!"

In truth, commercial interest in alpacas had already waned; the merino sheep, an import from the northern provinces of Spain, was proving profitable on Australian farms. Alfalfa and clover were being planted extensively and the need to raise animals on the marginal, unproductive highlands was not great. Further-

Mitchell Library, New South Wales

shows herders using bolas, two stone balls on a cord, to round up animals.

more, alpacas were strange to British-born farmers, and the colonists came to regard Ledger as an impractical dreamer.

In 1864 the government decided to get out of the alpaca business entirely. "No government has ever run a farm successfully," said Governor Sir John Young. For many years afterwards, Ledger's alpacas and llamas were to be found on farms in New South Wales and Queensland. But the animals were in flocks too small and too scattered to establish an industry. Most were so playful and gentle that they ended up as farm pets. The last representatives were finally sent to the zoo in Sydney.

In light of modern knowledge, it is instructive to consider whether Ledger was indeed an impractical dreamer. Today we very badly need to utilize marginal lands, for the good arable land is fast being taken up by food crops. The alpaca still seems an ideal animal for exactly the environment for which Ledger promoted it: higher slopes where sheep and cattle grow poorly.

Researchers in South America have recently recognized this, and alpaca research is advancing rapidly, especially in Peru, where almost three million head are under domestication. Alpaca meat is tender and has been compared to mutton.

Ledger had devoted 12 arduous years to the effort of introducing the alpaca to Australia. But in 1864 the flock for which he had risked so much had been dis-

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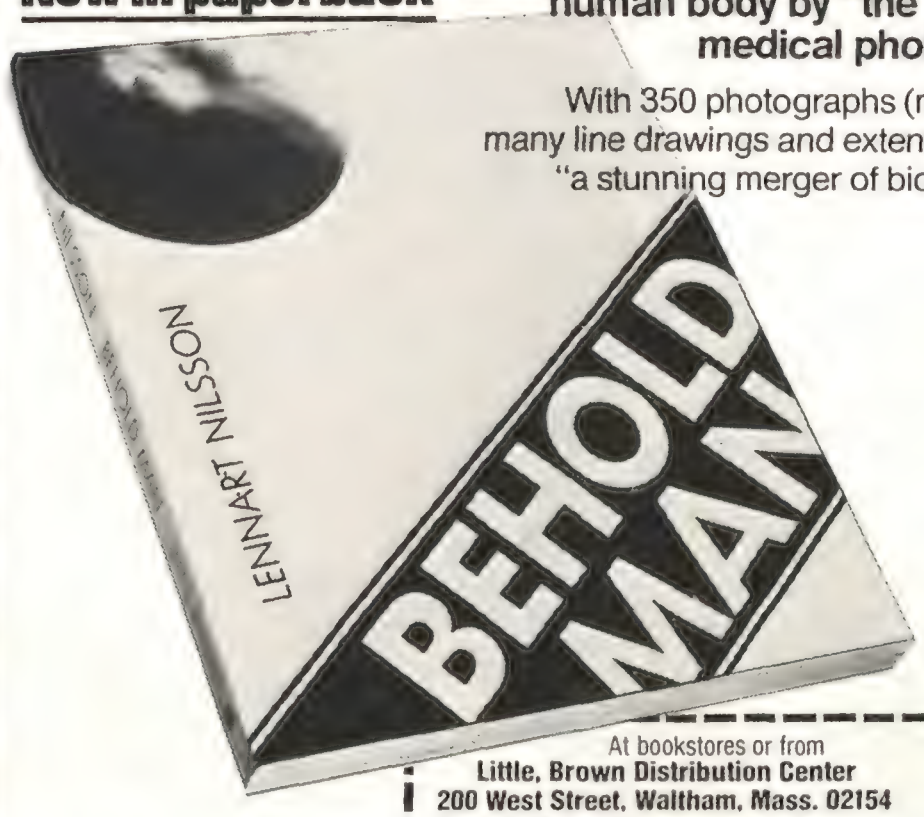

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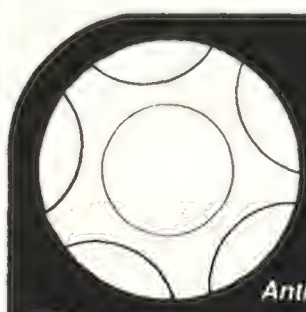

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In a respite from his odyssey, Ledger bathes in a lake called Laguna Blanca.

banded. He had lost everything, including his dream.

Hurt, bewildered and angry, he left Australia, reembarking with Pedro Cabrera for Peru. There Cabrera was killed for his part in smuggling out the alpacas. Ledger, however, seems to have been tolerated. For the Peruvians, this was a mistake, for he quickly set about smuggling another of their jealously guarded products: cinchona seed.

Throughout history malaria has killed more people than any other disease. Furthermore, for millions it has left a curse of fever, chills, weakness and malaise. Originally known as "ague," "fever" or "shakes," malaria has depopulated whole regions, upset military campaigns, and made vast areas of the tropics all but uninhabitable to European settlers.

The disease was by no means limited to the tropics. Charles II suffered from it, as did Louis IV; Oliver Cromwell died of

Mitchell Library, New South Wales

A few months later he drove the herd to a Chilean seaport and sailed for Australia.

it, and so did Alexander the Great. Cardinals feared the death of a Pope, for then they would have to convene in Rome—surrounded by malaria-ridden marshes. The disease contributed to the downfall of both ancient Greece and the Roman Empire. The United States had malaria, too. Long endemic in the South, malaria moved north during the Civil War.

In 1630 the Spanish learned from the Indians that an infusion of cinchona bark dramatically improves the condition of a malaria sufferer; the parasites disappear from the blood and the disease's symptoms are quickly alleviated. For three centuries it remained the only treatment, making the cinchona tree one of the most important medicinal plants of all time.

Cinchona flourished in the moist valleys and slopes of the Andean rainforest in Peru, Bolivia, Colombia and Ecuador. It is usually a small tree, al-

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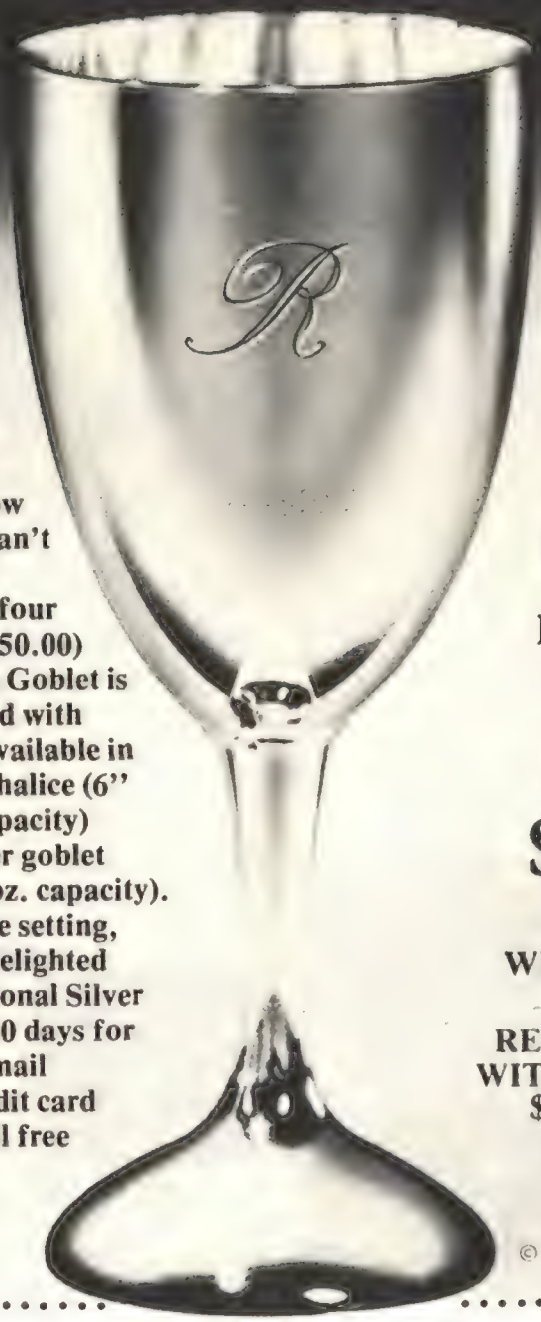

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though some types grow tall and slender with high, symmetrical crowns. The bark contains four medicinal compounds: quinine, quinidine, cinchonine and cinchonidine. Quinine, the most important, is the drug without which there could have been no European development of the tropics. It is instant poison to the malarial parasite.

In his trading, Ledger had seen the rising demand for cinchona bark created by European nations as they colonized the tropics in the mid 1800s. He also saw the native cinchona forests ruthlessly exploited, and he dreamed of organized production of quinine in British possessions in India, Africa and Southeast Asia, where millions were dying of fevers and malaria.

His second adventure began almost immediately upon his return to Peru. Four years earlier, during a visit to pick up his children, Ledger had asked his Bolivian Indian servant Manuel Incra Mamaní to collect seed of the best cinchona trees.

There are perhaps 20 species of the plant, and it is impossible to tell the quinine content of each without chemical analysis. Ledger earlier had kept track of the bark passing through his trading firm, however, noting that in Europe the best quinine assays seemed to come from the bark of trees with scarlet leaves. The local Indians called these trees *rojo* (red).

The localities from which the Indians secured *rojo* were a closely guarded secret. But Manuel had been a bark collector and knew where they were. In the almost inaccessible headwaters of the Río

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Mitchell Library, New South Wales

In another scene from the sketchbook, Charles Ledger gives orders to his scouts.

Beni, that flows into a tributary of the Upper Amazon in Bolivia, he found 50 tall *rojo* trees. He set up camp beneath them and waited for the seed to form.

Both Manuel and Ledger were taking a great risk. South American republics were hostile to attempts to transport cinchona seed to other countries. Strict laws were in effect, and the pair was engaged in illicit smuggling.

After his four-year vigil, Manuel brought the precious seed across the Andes in June of 1865, a terrible march of 800 miles. There were just 14 pounds of seeds but one day they would supply most of the entire world with quinine and save countless lives.

Ledger paid Manuel $750, dried the seeds carefully, wrapped them in animal hide, packed them in a box, and in July 1865 shipped them to his brother George in England. Three months later they reached London, and George Ledger promptly wrote to Her Majesty's Under-Secretary for the Colonies offering the seeds for planting in India and asking that his brother be paid for them. But the British had already spent thousands of pounds in sending a clandestine five-man expedition to the Andes to steal cinchona seed. The Under-Secretary rejected the offer outright, declining to pay Ledger even a paltry sum for his meager box of seed.

George was crushed by the rebuff and, concerned that the seed would lose viability, he contacted the Dutch cabinet minister for the colonies. The Dutch Consul General in Peru had previously sent huge quantities of cinchona seed to Holland, but somewhat grudgingly the minister bought one pound of Ledger seed for $40, promising to pay more if it germinated. Ledger had cared for the seed well; it arrived in the Dutch East Indies in good condition and grew easily. He was then paid an additional $200. Eventually, this seed was destined to brings returns of millions of dollars.

Prior to Ledger's efforts, both Dutch and British horticulturists had planted millions of cinchona seeds from their own collections. Years of work and hundreds of thousands of dollars had been invested, yet the whole effort was shaping up as a fiasco. Bark from some of the trees had no quinine at all and the average was less than two percent. Although some of the bark contained three percent, none of the varieties would ever prove profitable.

Though there was nothing unusual in the appearance of Ledger's seed, and though they already had other cinchona trees, the Dutch horticulturists, K.W. van Gorkom and J. C. B. Moens, took great care of them. From the single pound of tiny seeds they raised 20,000 seedlings. By 1872 the trees were thriving in the mountains of Java near Bandung and large quantities of Ledger bark were offered for sale. It proved extraordinarily rich in quinine, averaging five to eight percent, some samples even reaching the undreamed-of level of 13 percent.

By 1879, plantation-grown Ledger trees

The bark of wild cinchona tree is harvested by hand in South America.

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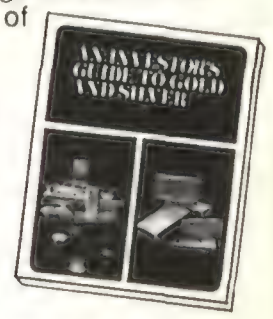

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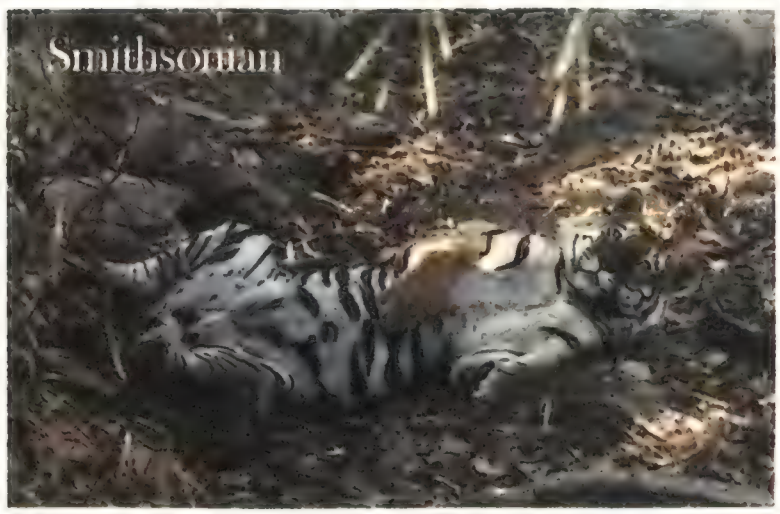

SMITHSONIAN almost never reprints a picture but we predict a landslide of requests for Peter F. R. Jackson's study of the contented great cat on this month's cover. While not exactly life-size—that would be too much—our full-color blow-up will measure 33 inches by 22 inches.

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The first planting of Ledger's seeds in Java produced this healthy grove.

were ready for harvest. They saved the whole cinchona effort. Van Gorkom and Moens had gone to extraordinary lengths. Millions of the old, worthless trees were already growing on Java, and their pollen threatened to pollute the Ledger trees. To prevent this, they cleared remote forest tracts and planted the Ledger seed so far from the old trees that insects could not cross-pollinate the two. Later, they organized the complete felling of all the old plantations, and decreed that only Ledger seed could be planted. They learned the genetics, chemistry and ecological needs of the new trees, and when Moens decided that *rojo* was a true species he named it *Cinchona ledgeriana.*

The high quinine concentrations of the bark brought great savings in production, transportation and quinine processing. It is entirely owing to Ledger's seed that Java was able to supply quinine to the world. In 1880, the main bark production still came from South America, but by the 1930s Java was producing 97 percent of the world's supply.

While Charles Ledger's second dream was becoming this spectacular reality, his personal fortunes had failed dismally. He had lost all his money over the alpaca

The Dutch parlayed these trees into a multimillion-dollar business.

affair and now he felt cheated of the reward for his cinchona seed discoveries. Pedro Cabrera had been killed for helping get the alpacas out of Peru; now Manuel had met a similar fate after he returned to Bolivia to procure more cinchona seed.

In 1874 Ledger recorded: "Poor Manuel is dead also; he was put in prison by the Corregidor of Coroico, beaten so as to make him confess who the seed found on him was for; after being confined in prison for some 20 days, beaten and half starved, he was set at liberty, robbed of his donkeys, blankets, and everything he had, dying very soon after."

By now Ledger himself was persona non grata in Peru. He later lived in Argentina and Uruguay and finally, in 1883, retired to Australia, broken and defeated. To its credit, the Dutch government paid him an additional $480 in 1880 when the value of his seed became apparent. Fifteen years later—when their cinchona trade was booming—the Dutch again recognized their debt by paying an *annual* salary of $480. But ill fortune continued to dog Ledger and he lost his entire savings in the Australian bank failures of the early 1890s. When he died

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in 1905 at the age of 87, his whole estate was valued at only $10.

Despite his personal failures, Charles Ledger's efforts have continued to influence history right up to today. In 1942, the Japanese invasion of the Dutch East Indies jeopardized the Allies' entire quinine supply. Army Colonel Arthur Fischer heroically gathered Ledger cinchona seeds from different parts of the Philippines, where their cultivation was being attempted. He got them out on the last plane to Australia before the Japanese took over. In this way Ledger's seed returned to the New World. With it, the Merck Company established plantations in the highlands of Guatemala. But cinchona trees take years to mature and quinine for the Allied war effort actually came from South America, harvested as in Ledger's day from wild trees.

During the 1940s, synthetic antimalarial drugs were developed and proved cheaper, and often more effective, than quinine. After the war, cinchona's demise as a crop appeared imminent and most plantations were abandoned to the jungle. The Vietnam war demonstrated, however, that the synthetic drugs, though extremely effective, specifically affect only a few parasite strains, whereas cinchona bark extract, with its mixture of alkaloids, has broad-spectrum activity and suppresses many parasite types. Thus, in the late 1960s, Ledger's trees again became important. Overgrown plantations were restored, fertilized and expanded in Guatemala, Indonesia and the Congo (now Zaïre). After a century, the seeds so carefully collected by Manuel Incra Mamaní were still helping to save lives. And they may continue to do so, for malaria is on the increase around the world. In 1976, the World Health Organization estimated 1.5 million malaria deaths.

Charles Ledger's efforts have also made possible two other products widely used today. Quinine is the ingredient that gives the tangy, bitter taste to tonic water and related soft drinks. And quinidine, another bark-extract ingredient, is a drug used to control abnormal heartbeat.

Throughout his life Ledger never received the credit that was his due. Today we owe him some measure of recognition. At the very least, recall your debt when ordering a gin and tonic.

Manual Incra Mamaní waited four years for seeds from the right cinchona tree. When he returned to Bolvia for more, he was arrested, beaten—and died.

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Book reviews

The Oxford Book on Oxford
Chosen and Edited by Jan Morris
(Oxford University Press, $13.95)

If you like books and anecdotes, scholarly collegial history, extraordinary eccentrics, wit and belly laughs, here is a book that should make you happy. If you do not you are probably beyond help, but if anything can rescue you, it might be this book. It is very good summer reading and just as good for winter, spring and fall. How often do you get a good book for all seasons? A permanent book? Well, then.

Jan Morris, a world-class journalist, capable (some, including me, would say) of writing literature, has created such a book. It is composed of the work of others, spanning the centuries from medieval times until almost now, and laced with interstitial commentary.

Open this book at any page—74, for example. Here we learn of Jacob Bobart, 17th-century gardener of the Oxford Physick Garden. He was seized by his beard, one day while in the garden minding his business, by one Mark Coleman who ". . . caught fast hold of J. Bobart['s] long beard, crying, 'Help! Help!' Upon which people coming in and enquiring of the outcry, Coleman made reply that Bobart had eaten his horse and his tayle hung out of his mouth." (Coleman himself was described by a contemporary as being "ye distracted man, one well skill'd in Musick, when hee was in his right minde. . . .")

Ahem. Where to now? Page 23 will tell you the names of the first 12 books in Merton College library, all together worth in 1360 about £132, or about half the value of an ocean-going ship.

We learn on p. three that the Founding Fathers "fondly reasoned" that physical discomfort was good for the mind, "which is perhaps why the University of Oxford came into being at that catarrhal point of the English Midlands where the rivers Thames and Cherwell soggily conjoin." And Max Beerbohm, in fact, would have it no other way, p. 332: ". . . I would liefer have the rest of England subside into the sea than have Oxford set on a salubrious level. For there is nothing in England to be matched with what lurks in the vapours of these meadows, and in the shadows of these spires—that mysterious, inenubilable spirit, spirit of Oxford. Oxford! The very sight of the word printed, or sound of it spoken, is fraught for me with most actual magic."

The University's first chancellor was Robert Grossteste (1175-1253). There were 11 other ways to spell his name, including Greatheved, Grosehede, Greatheade and even Grouthead.

There is this wisdom, p. 323, of G.W.E. Russell's: "Wherever philosophical insight is combined with literary genius and personal charm, one says instinctively, 'That man is, or ought to be, an Oxford man.'" One supposes that in those days —1907 it was—such a thing needed to be said; whereas today, of course, it is taken for granted, particularly at Cambridge. (What, you wonder, would an Oxford Book of Cambridge be like? Or a Cambridge Book of Oxford?)

The book is not by any means only an accounting of eccentric behavior and opinion, some of it bordering on dementia (the professor who had a reputation for eating anything at all and who, shown a preserved heart of a king of France, popped it into his mouth, remarking that he had never had anything like that kind of opportunity before). There are many such things in the book and there are sections on the growth of the university, its college system, religious conflict, and the University Press, that monument of superb publishing now celebrating its 500th anniversary. There are Samuel Johnson, Evelyn Waugh, Graham Greene, Benjamin Jowett, Maurice Bowra, Shelley, Orwell—name somebody and if he weren't at Cambridge he was here.

And there was Spooner, from 1903 to 1924, the Warden of New College, the man whose beloved behavior inspired the word "Spoonerism" in the *Oxford English Dictionary*. "In the sermon I have just preached, whenever I said Aristotle, I meant St. Paul." That is Spoonerism. And: "Do come to dinner tonight to meet our new Fellow, Casson. 'But Warden, I *am* Casson.' Never mind, come all the same." Also: "Undergraduates recur."

You are tempted to say that Oxford (and its coevals around the world, no need to name them) is an ornament of Civilization, and, reflecting on that, you realize that Oxford *is* Civilization.

—Bennett Schiff
Board of Editors

The Edgar Allan Poe Scrapbook
Edited by Peter Haining,
Foreword by Robert Bloch
(Schocken Books, $15; $7.95, paperback)

For those who can still recall the fear and trembling they felt on first looking into the world of Edgar Allan Poe—and practically everyone can—this collective work will afford hours of pleasurable musing. Packed with essays, newspaper articles, reviews, souvenirs, engravings, pictures, photographs, letters and comic strips, Haining's book is like the attic of an old Gothic mansion (in this instance, the House of Usher) filled with the kind of miscellany that can accumulate over 150 years. In every corner lurk puzzles and curiosities waiting to be unburied.

By far the greatest curiosity is Poe himself, one of literature's least understood figures. Born January 19, 1809, in Boston, Poe lived his 40 short years, Haining writes, "in the shadows, known by few, cared for by even less." It would almost require C. Auguste Dupin, Poe's famous sleuth, to distinguish between the fact and fable in Poe's life—including the time and place of his birth. Even for Dupin the task would be vexingly formidable because of the countless red herrings, many of them cast by Poe himself, but most conjured up by his literary executor, Dr. Rufus Griswold.

Haining has dutifully gathered the varying accounts of the events in Poe's life. But, interspersed with the many eerie engravings and ghostly photographs, these facts pale when placed beside the other-worldly shine of the legendary Poe. Mysterious cartoons from *Psycho* magazine, A. D. McCormick's somber drawing of a shrouded figure confronting Arthur Gordon Pym, Stephen Lawrence's illustration for Bloch's "The Man Who Collected Poe," from *Famous Fantastic*

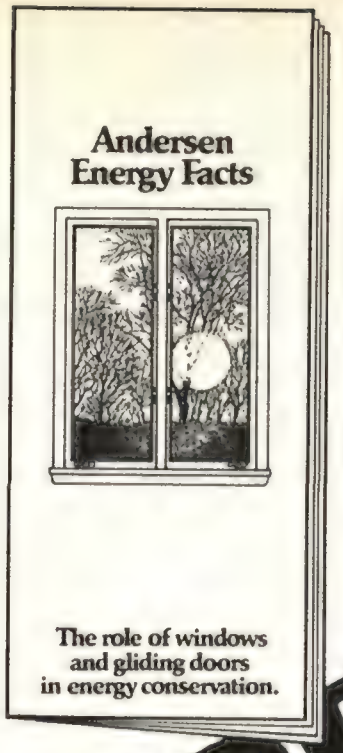
Mysteries, the pop horror of the Vincent Price movies, and the chiaroscuro engravings of Poe's melancholy visage are the delights of Haining's book as well as the sustainers of the legend.

Even without the deliberate distortions of Dr. Griswold and the fantastic paraphernalia of the stories and drawings, Poe's life is the stuff of lurid melodrama. He lost both parents before he was three, argued fiercely with his guardian, John Allan of Richmond, and was forced to leave the University of Virginia for lack of funds. Poe then served two years in the army and a year at West Point before he was dismissed for infractions of the rules.

Later, his marriage to his 13-year-old cousin, Virginia Clemm, was cut short by her death at age 24. Trying to scrape together a livelihood as an editor, critic and free-lance writer, Poe spent most of his days in penury and misery, resorting to alcohol and even to drugs.

Such biographical data are bleak enough. But Griswold's slanderous and

Stephen Lawrence's illustration for Bloch's "The Man Who Collected Poe" from *Famous Fantastic Mysteries,* 1951.



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malicious article, "The Death of Edgar A. Poe," transmogrified him into the depraved psychotic of American literature. "His imagery was from the world which no mortal can see but with the vision of genius," Griswold attests.

In spite of scholarly evidence to the contrary, Griswold's image of a perverse Poe prevails. The first film version of Poe's life, by D. W. Griffith (1909), features a long-haired madman, a marble-pale consumptive teen-age woman, usually in a prone position, and a stuffed raven perched upon Poe's wardrobe. Cartoonists and film makers have capitalized upon these bizarre trappings.

What is indisputable is that Poe has endured not only as a literary legend but also as a writer of genius. Haining includes appreciations of Poe by such writers as Walt Whitman, Jules Verne, Fyodor Dostoevsky, Ellery Queen and H. P. Lovecraft. Although Haining's homage occasionally seems excessive, Poe's achievement cannot be denied: he was perhaps America's first true literary critic, the father of detective fiction and, some say, of science fiction, a major influence upon the short story form and the perfecter of the modern horror story.

It is also indisputable that Poe has surprising contemporaneity. This year Harvard University's Belknap Press published in two volumes the complete *Tales and Sketches.* Yearly, awards are presented in Poe's honor. Most important, as Haining's *Scrapbook* demonstrates, Poe still delights and affrights people of all ages.

Haining's *Scrapbook* is a compendium of all the quaint and forgotten lore of Edgar Allan Poe. An attractive coffee-table volume, it is not intended to be read at one sitting, but rather to be dipped into and pondered—preferably on evenings that are dark and dreary.

—Paul Piazza
Author, *Christopher Isherwood: Myth and Anti-Myth*

In Patagonia
Bruce Chatwin
(Summit Books, $8.95)

Looking at a map of Patagonia, the wild, almost mythic region of southern Chile and Argentina, one spots the cheerless place names of Port Famine, Desolation Island, Last Hope Sound and Valley of the Martyrs. This seems a bleak and forbidding part of the world, one of white dust, ghostly winds, deserts, thornbushes. Small wonder that Butch Cassidy and the Sundance Kid took refuge there from the law. Patagonia has long attracted exiles, vagabonds and fossil hunters. An explorer wrote, "There are only two valid reasons for ever visiting that bitter land, curiosity and desire for gain."

Bruce Chatwin, the author of this remarkable book, was drawn by curiosity. In his grandmother's house in England he had often admired an ancient, leathery piece of skin proudly displayed in a glass-fronted cabinet. This "brontosaurus" had been a wedding present to his grandmother from her cousin Charley Milward, captain of a merchant ship that sank near the Strait of Magellan in 1898. Charley heroically saved all the passengers, but lost any hope of another command. So he settled in Patagonia. Searching through a cave somewhere in Chile, he found the remains of a giant sloth and sold them to the British Museum, keeping a few pieces to send friends. "The Charley Milward of my imagination was a god among men," writes Chatwin, who went to Patagonia on a kind of pilgrimage awaited since childhood.

Walking along desolate roads with a rucksack thrown over his shoulder, roughing it, hitching rides with truckers, feeling comfortable with his Spanish and eager to meet strangers, Chatwin proves an uncommon traveler. He shows Patagonia to us in a shimmering montage of anecdotes, legends, sea tales, interviews and impressions, informed throughout by a language that is precise, lyrical, vigorous. Nothing seems to escape Chatwin's eye. On a boat to Ushuaia, for example, he studies the peculiar manners of a big man with "blotchy red face, upturned moustaches, and the syrupy eyes of an Ottoman pasha." In a small room with an autographed picture of Neil Armstrong on the wall, he watches an Indian girl "suckling her baby, devouring visitors with mica-shining eyes."

Whether describing the flight of an albatross, ruminating on the nature of the Yaghan language or sketching the exploits of a bloodthirsty Scotsman the natives call the Red Pig, Chatwin portrays himself as a man of immense vitality, always inquiring, taking notes, tracking down leads, darting about like a gypsy. He doesn't tell us when he visited Patagonia or for how long he stayed; thus the brief, lively chapters of his book have the fantasylike quality of a dream sequence.

We fancy a place where time is suspended. Patagonia is a land of exiles. In a frontier settlement the author meets a woman doctor born in Russia who now spends every spare peso ordering the works of Pasternak, Mandelstam, Gumilev and Akhmatova from the YMCA Press in Paris. How did she get here? "I was a nurse in the war. I was captured by the Nazis. When it was over I found myself in West Germany. I married a Pole. He had a family here."

In a Welsh colony Chatwin is taken to see a child prodigy, mother German and father Italian, who'll soon enter the conservatory in Buenos Aires. The boy wants to know everything about Liszt and Wagner and shows a passion for all things European, "the authentic blinkered passion of the exile." He takes out a small white plaster bust of Chopin and sets it on the piano, then begins to play a haunting, elegant mazurka.

These are the people Chatwin came looking for in Patagonia—the Charley Milwards of that faraway, melancholy realm. Their stories are touching and memorable, and perhaps the finest feature of an altogether luminous book.

—Ronald Varney
Free-lance writer and critic

The Common Press
Elizabeth Harris and Clinton Sisson
(David R. Godine, $20)

To the general public, book publishers are rather anonymous folk. Indeed, anonymity seems to be the nature of the business, for while people consciously buy, say, a General Motors automobile or an Arrow shirt, they hardly ever buy a Little, Brown biography or a Pyramid paperback. What they do buy is the reminiscences of a politician or a novel on the best-seller list.

Can this be the reason why publishers —economics aside—all too often don't pay attention to the quality of the package? Whatever the reason, and economics are a factor (though not so important as they would have us believe), rare is the publisher who cares a fig for attractive design, well-defined printing on quality paper and a lasting binding. Indeed, books, once handed down as family heirlooms, have become, like watches in affluent societies, throwaway items.

Happily, though, there are a handful of publishers who, while not ignoring the

commercial aspects of book publishing, have managed to produce books distinguished by style, elegance—and permanence. Foremost among them is David R. Godine of Boston.

In less than a decade, Godine has established himself as a mettlesome (the more commercially inclined would say foolhardy) publisher of wide-ranging interests and impeccable taste. His limited editions ("excesses," Godine himself calls them) are eagerly sought by bibliophiles and investors. His regular editions, whether hard or soft cover, provide solid evidence of what moderately priced books can be, given care and attention.

Now appears *The Common Press*. In two 8½-by-11-inch slipcased volumes (one is a text of 64 pages, the other one of eight drawings), *The Common Press* describes in detail an English common press found in the Smithsonian's Museum of History and Technology.

There is a legend behind this press—that Benjamin Franklin printed on it when he was a 19-year-old apprentice to John Watts in England. The legend is hard to prove. In her text, Elizabeth Harris admits that any proof is based on "hearsay and conjecture" even though Franklin himself, 40 years later, in 1768, identified the press as the one he used. No matter. Like all legends, this one adds a touch of romance and no doubt deserves our attention.

It is not the legend that makes this book remarkable, however. Nor is it the Harris text as such. (After all, even a poet would have trouble trying to describe a hand press with any sense of excitement.) The strength of the book lies in the detailed explanation of the workings of the common press, supported by the skillful drawings of Clinton Sisson, themselves minor works of art. What the book does is to dissect the press, nut by bolt by tympan, as neatly as a medical text on surgical technique. And why? Not only to demonstrate how the press works, but also to enable one to build a full-size replica.

And, once built, the press can be used to print up a notice to publishers, encouraging them to improve the quality of their books. One can also print up a warm note of appreciation to publishers like David R. Godine, to whom books are more than a merchandisable product. They are a way of life.

—John F. Warner
Boston-based writer and editor

A Candle Can Tell You a Lot About Great Wine. Or Great Whisky.

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Kentucky Straight Bourbon Whisky. 86 or 100 Proof. Brown-Forman Distillers Corp. Louisville, Ky. ©1977.

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Additional reading

Operation Tiger (p. 28)

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Exploring the World with the Smithsonian

For both the seasoned and would-be traveler, the Smithsonian has developed a travel program to meet a variety of tastes and budgets. In order to accommodate the increasing growth and interests of Smithsonian Associates, the tour programs have expanded, bringing travelers to places reflecting the Institution's interests.

Three types of trips are available, Charter, Domestic and Study, each with its distinct character. Foreign Study Tours provide small groups with culturally oriented, specialized trips, under the guidance of museum curators or experts in respective fields. Foreign Charter Tours, consisting of several small groups under the leadership of skilled guides and interpreters, are lower in cost, combine study, discovery and vacation. Domestic Tours offer specialized guidance and expertise generally unavailable to persons traveling on their own.

Foreign Charter Tours

Japan—November 5-21: The heart of historic Japan with an extended program in Kyoto and Nara followed by choice of travel seminars to the Inland Sea, the Sea of Japan or Kyushu. Conclude in Tokyo with visits to Nikko or Kamakura.

Winter Russia*—December 28-January 11: Includes the historic and diverse cities of Leningrad, Tallinn and Moscow plus optional two-day excursion to Vladimir and Suzdal; attend special Winter festivities including gala New Year's Eve party and a traditional troika ride.

Mayan Mexico: The Yucatán Peninsula—January 4-16 or January 28-February 9: A complete tour of the extraordinary Mayan ruins of Yucatán. Accompanied by an archaeologist, visit the sites of Chichén Itzá, Palenque, Uxmal, Tulum, plus the seldom visited sites of Edzna, Kohunlich, Río Bec and Cobá. Also includes a brief pause at Akumal on the Caribbean Sea. An adventure tour. (Originates and ends in Mérida.)

Guatemala—January 17-28 or February 14-25: In the company of an archaeologist, visit Tikal, the monumental Mayan city of the Petén jungle; Copán, a Mayan site deep in the mountains of Honduras; plus the Mayan ruins of Quiriguá, El Baúl and La Democracia. Travel to the Guatemalan highlands to visit Lake Atitlán and Antigua—the Spanish colonial capital preserved in its 17th- and 18th-century splendor. Also visit Chichicastenango with its ancient market and Indian rituals.

New Zealand and Fiji—February 21-March 11: This exciting tour includes Mt. Cook, Te Anau and Milford Sound, plus Auckland, Rotorua, Wellington and Christchurch. Included will be talks on New Zealand's natural history, Maori heritage, parliament, plus a home visit. Brief rest stop at Fiji before return. (Originates and ends in Los Angeles.)

Kenya, East Africa*—February 1-18: Wildlife and tribal life adventure providing modern African insight—and the "Africa that used to be," in the old safari tradition. Seminars in Nairobi and in the field.

Low cost of tours includes first-class hotels, most meals, sightseeing, lectures, theater tickets and air fare. *Optional predeparture course will be available.

Write Smithsonian Associates Travel Program, A&I 1278, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5635 for brochures on specific tours.

Domestic Study Tours

Toronto—September 19-25: Special program of museum lectures and walking tours to experience the exciting diversity of this city's art and architecture. Also visit Stratford Shakespeare Festival.

Weekend at the Hirshhorn Museum and Sculpture Garden—September 22-24: A weekend devoted to the Hirshhorn's exemplary collection of 20th-century painting and sculpture, with films and discussions.

Desolation and Gray Canyons—September 29-October 9 or October 10-20: White-water trip for the adventurous; explore the geology, wildlife and exciting Indian and outlaw history of Utah's Green River.

California Wine Country—October 1-7: From San Francisco, visit selected vineyards with wine tasting and special lectures by vineyard owners and discussions with wine masters.

Illinois Archaeology—October 14-21: Join archaeologists in the excavation of an Illinois River valley site spanning almost 10,000 years. Actual digging will be supplemented by instruction, lectures, laboratory work and field trips.

Colonial Williamsburg—October 25-29: This program for adults, with accommodations at the renowned Williamsburg Inn, will examine life in the 18th century, with special tours and programs.

Christmas at the Smithsonian—December 8-10: Seventh annual Christmas weekend with traditional tree-trimming party and special behind-the-scenes tours.

Virgin Islands Adventure—January 5-14: Explore the British Virgin Islands by chartered sailboat to learn about the spectacular life of the coral reef.

Washington "Anytime" Weekend: Choose any weekend to visit the nation's capital and enjoy a special tour of the original Smithsonian building, spend two nights at Loew's L'Enfant Plaza Hotel close to the Mall. Reservations and payments must be received at least ten days prior to arrival.

Write Smithsonian Associates Travel Program, A&I 1278, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5635 for brochures on specific tours.

Foreign Study Tours

Aegean Sites of Civilization—October 7-29, 1978: A cruise on MTS *Argonaut* with Dr. Richard H. Howland, including Thrace, Istanbul, Troy, Ionia, Mt. Athos, Mistra, Thera, Crete and principal classical sanctuaries, leaving from and returning to Athens. *Optional prelude may be the following:*

Nostalgic Orient Express—October 2-8: Vintage cars restored to superb condition, over original Simplon routing from Zurich to Athens (waiting list).

Iranian Art and Archaeology—October 16-November 4: Led by Dr. Michael Roaf of Oxford, stay two nights in London, then Teheran, Shiraz, Persepolis, Pasargadae, Isfahan, Arak, Ecbatana, Kangavar, Bisitun, Kermanshah, Taq-i-Bustan, Qasvin, Varamin, Rey and Mashhad.

Red Sea Passage—February 1-11, 1979: Revised version of our very popular voyage of this past winter. Sail from Suez on the *Argonaut,* visit Karnak, Luxor, Valley of the Kings, Abu Simbel in Egypt and Petra in Jordan. Stay at the Mena House Hotel next to the pyramids for Sakkara and Memphis, the mosques, bazaars and Archaeological Museum of Cairo. Cruise subscribers may choose from the following options. **Jerusalem Prelude**—January 25-February 2; **Tanzania Game Preserves**—February 11-18.

For detailed information, write: Miss Bliss Schumann, Foreign Study Tours, S.I. 123, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5520.

Smithsonian highlights

August events

Hall of American Maritime Enterprise
The exhibits in this new hall, a permanently installed addition to the Museum of History and Technology, traces the history of America's commercial shipping industry from Colonial times. Opening on August 11, the Hall of American Maritime Enterprise includes several ship models, period rooms and furnishings, and scrimshaw.

Of special interest are the pilot house from a river boat, a tattoo parlor and the stained-glass ceiling from the 19th-century luxury liner *Majestic*. The interior of an engine room is represented, as well as the interior of an 18th-century dockside warehouse.

Short films introduce visitors to the history of American shipping. Small models trace construction styles over the decades. A section called "Locks, Pools and Dams" includes a small model that travels through a lock system.

Philip Evergood: Selections from the Hirshhorn Museum and Sculpture Garden
Forty-two examples of Evergood's work—paintings, drawings and water colors—from the Hirshhorn's own collection will be on exhibition between August 11 and October 8.

Designs from the movies
Photographs, drawings and plans of architectural projects that were influenced by movies and movie sets are displayed this month at the Cooper-Hewitt Museum of Design in New York City. The show runs from August 15 to October 7.

U.S. Navy Commodores concerts
The Museum of History and Technology sponsors concerts by this Navy band on the Mall Terrace from 6 to 8 P.M. every Wednesday evening in August.

Army Blues Band concerts
Also on the Mall Terrace of the Museum of History and Technology, these concerts will be presented from 6:30 to 8:30 P.M. August 10, 24 and 31.

Army Brass Quintet
Also on the Mall Terrace of the Museum of History and Technology, this quintet will perform on August 17 at 6:30 P.M.

The Not-So-Naked Eye
This month's free lecture at the National Air and Space Museum's Albert Einstein Spacearium examines prominent stars, constellations and the "deep six" objects visible in the current evening sky. The lecture is scheduled for August 5 at 9 A.M.

Continuing events

Silver Hill Museum
This aviation preservation and restoration complex, part of the National Air and Space Museum, is opened for public tours on Wednesdays and Fridays at 10 A.M. and on Saturdays and Sundays at 10 A.M. and 2 P.M. Reservations are required two weeks in advance and may be made by calling (202) 381-4056 between 9 A.M. and 4 P.M. Monday through Friday.

Hirshhorn Museum and Sculpture Garden
" 'The Noble Buyer': John Quinn, Patron of the Avant-Garde," an exhibition of 79 paintings, sculptures and drawings by 26 widely known modern artists, will continue through September 4.

National Collection of Fine Arts
"Past and Present: A Century and a Half of a National Collection," made up of 200 works from the NCFA's holdings, continues through September 4.

Cooper-Hewitt, Museum of Design
"Embroidery Through the Ages," two exhibitions of embroidery, are on view at the New York museum through September 2.

Contributing Memberships

Contributing Members of the Smithsonian Associates support the Institution's work in education, research and scholarship. There are three categories of membership: supporting at $50, donor at $100, and sustaining at $500. Among the special privileges offered to contributing members are:

- Illustrated exhibition publications by Smithsonian scholars
- Invitations to selected previews of major exhibitions

National Contributing Members receive advance notice and illustrated publications about Smithsonian Traveling Exhibitions and complimentary tickets for Regional Program activities in their area. Contributing Membership is tax-deductible within the limits of the law. For more information, please write Contributing Membership Program, A & I Building 1208, Smithsonian Institution, Washington, D.C. 20560.

Smithsonian Institution Traveling Exhibition Service

SITES circulates exhibitions to hundreds of cities throughout the United States. For a list of shows and locations write: Eileen Harakal, SITES, Smithsonian Institution, Washington, D.C. 20560. A partial list of summer openings follows.

- Pacific Grove, California—"Birds of Prey: Paintings by Louis Agassiz Fuertes" are on view at Pacific Grove Museum of Natural History, August 5 through September 3.
- Charlotte, North Carolina—"American Drawings 1976," may be seen at the Mint Museum of Art between August 12 and September 10.

• Athens, Ohio—"Toys from Switzerland" will be shown at the Trisolini Gallery from August 26 through October 8.
• Beaumont, Texas—"Locks from Iran: Pre-Islamic to Twentieth Century" is to be displayed at the Beaumont Art Museum August 19 through September 24.
• Bethlehem, Pennsylvania—"Ride On!" presents the history of bicycling in America at 1761 Tannery through August 27.

Parking for visitors

Street parking near the Smithsonian complex is difficult. Use of public transportation is recommended. The Air and Space garage, 7th Street and Independence Avenue, S.W., is open daily from 7 A.M. to 10 P.M. Recreational vehicles higher than seven feet are prohibited from garage parking.

Regional program invites cosponsors

Regional activities of the National Associate Program in 1978 included exhibitions, lectures, workshops and performing arts events in cities throughout the United States. Museums and cultural and scientific organizations interested in cosponsoring regional programs for 1979 may write: R. H. Angle, Smithsonian National Associate Program, 900 Jefferson Drive, Washington, D.C. 20560.

When visiting the Smithsonian

Members are invited to begin their visit by registering with the Associates receptionist in the Smithsonian Institution Building—the castle on the Mall. Here, between 10 A.M. and 4 P.M. daily, Associates receive special orientation materials to ensure a more enjoyable visit. Membership cards are replaced upon presentation of a SMITHSONIAN magazine address label. Here, too, the Associates Lounge offers a haven in which to relax. To aid in visit planning, members are encouraged to send a postcard or phone for an information packet: Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560; (202) 381-6264. Please allow two weeks for receipt.

The Court
The Court, a restaurant for Associates, located in the Museum of Natural History, is open from 8:30 A.M. to 7 P.M. daily. Service is buffet style with breakfast, lunch and dinner offered Monday through Friday. On Saturday and Sunday, brunch is served in addition to breakfast and dinner. Prices are $2.95 ($1.80 for children) for breakfast, $3.95 ($2.80 for children) for other meals (beverage and dessert not included). Entrance for breakfast is via the Museum of Natural History's Constitution Avenue entrance. Membership cards are required.

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By Patrick Ryan

To female fire-eaters: don't forget, exhale!

Once again I got that old feeling of terrestrial nonentity when I read about Jean Chapman, a housewife in Stoke Poges, England, who had "just claimed a world record after downing 1,921 torches in two hours at a local pub." Mrs. Chapman was a professional fire-eater before marriage, but now only masticates the flames for charitable purposes, as in this latest foray which commendably helped to raise almost $4,000 toward the purchase of a heart-lung machine.

While giving place to none in admiration of the brave lady's pyrophagic zeal, convivial colleagues of mine were unanimous that she should not be allowed in our local pub because of the danger that her fiery display might cause the precious alcohol of neighboring drinkers to go up in sympathetic combustion. It was agreed, however, that downing 1,921 burning torches must be a surefire method of working up a wonderful thirst.

Fire rituals are said to go back to at least the late seventh century B.C. and to Zoroastrianism, in which the god Asha Vahista presided over fire as the symbol of Order, or Truth. Medieval flame-eating jugglers inspired such fear that some were hanged for witchcraft.

John Evelyn recorded in his *Diary* in 1672 that he was entertained by *"Richardson* the famous *Fire-Eater,* who before us devourd *Brimstone* on glowing coales . . . then taking a live Coale on his tongue, put on it a raw oyster, which coale was blown on . . . till it flam'd & sparkled in his mouth . . . til the Oyster gaped. . . ."

All very well, I suppose, if you happen to be partial to burned oysters, but, for my part, I would stick to swallowing them *au naturel* with a little brown bread, a dash of cayenne pepper and a sufficiency of Irish stout.

Fellow supporters of women's lib may be pleased to learn that the best-known exponent of fire-eating in the early 19th century was Signora Josephine Girardelli, who was billed as the "Fireproof Lady" or the "Human Salamander." At the famous Bartholomew Fair, held annually for more than 700 years in London's Smithfield, reports from around 1814 proclaim that "This lady put melted lead in her mouth . . . passed red-hot iron over her . . . tongue and her hair . . . and washed her hands, not only in boiling lead, but also in boiling oil and acquafortis." I don't know much about the last two ablutionary solutions, but research has taught me that the molten lead was likely to have been the showman's compound of antimony, which, while visibly resembling lead, has such a low melting point that it liquefies readily.

That females of today are still following faithfully in the smoke trail of the asbestic signora became evident in the report of a Yorkshire newspaper about the inflammatory activities of a choirgirl named Cilla, despite the sad romantic impediment entailed. "Tomorrow," the article revealed, "when she takes another sip of turpentine and kindles the choir bonfire on the beach, her mother . . . who is convalescing in a seafront hospital, will be able to get a grandstand view. . . . Cilla said: 'The one snag to being a fire-eater is that boyfriends tend to tell you that you smell like a filling station.' "

To any young readers who feel inspired to take up the torch from Cilla, I would proffer the cautionary advice that the cardinal rule for fire-eaters is the same as that for piccolo players, "Never suck . . . always blow." This prescription is supported by no less an expert than Dan Mannix, who, in his entertaining book, *Memoirs of a Sword-Swallower,* tells how he worked up from carnival spectator to "America's leading fire-eater." Don't inhale, he advised, but continually exhale, the trick being to keep "a steady almost imperceptible stream of air coming out of the mouth. . . ."

Though not presuming to be definitive, he opined that "apparently the extreme heat of the flame coming suddenly in contact with the moisture inside the mouth creates a thin layer of steam which acts as insulation." Furthermore, never work if there's a wind blowing, keep your lips wet, and ensure that the flaming torch heads are tied securely so they won't drop off into your gullet. And the best of luck to all apprentice fire-eaters.

And while no man has yet claimed to have downed 1,922 torches in two hours, a blister-lipped male does hold the world championship for the longest lung-projected flames. In Rugby Cattle Market, England, for a television film made in October 1975, one Peter De-Valle (né Ashton) blew a still unbeaten tongue of fire measuring no less than 19 feet 8 inches from lip to tip. The records do not relate, however, just what happened to the forelock and any face foliage of the gallant chap who intrepidly measured the length of the expirated conflagration.

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